MAKE YOUR OWN GREETING CARDS

HOT CoCo®

THE MAGAZINE FOR TANDY COLOR COMPUTER® USERS.

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Great Gift Ideas
For You and Your Color Computer

- **OS-9**
 Expert Answers To Your Questions
- **Custom CoCo**
 Three Simple Mods To Make Life Easier
- **Speech**
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A Mouse and Click-Down Menus

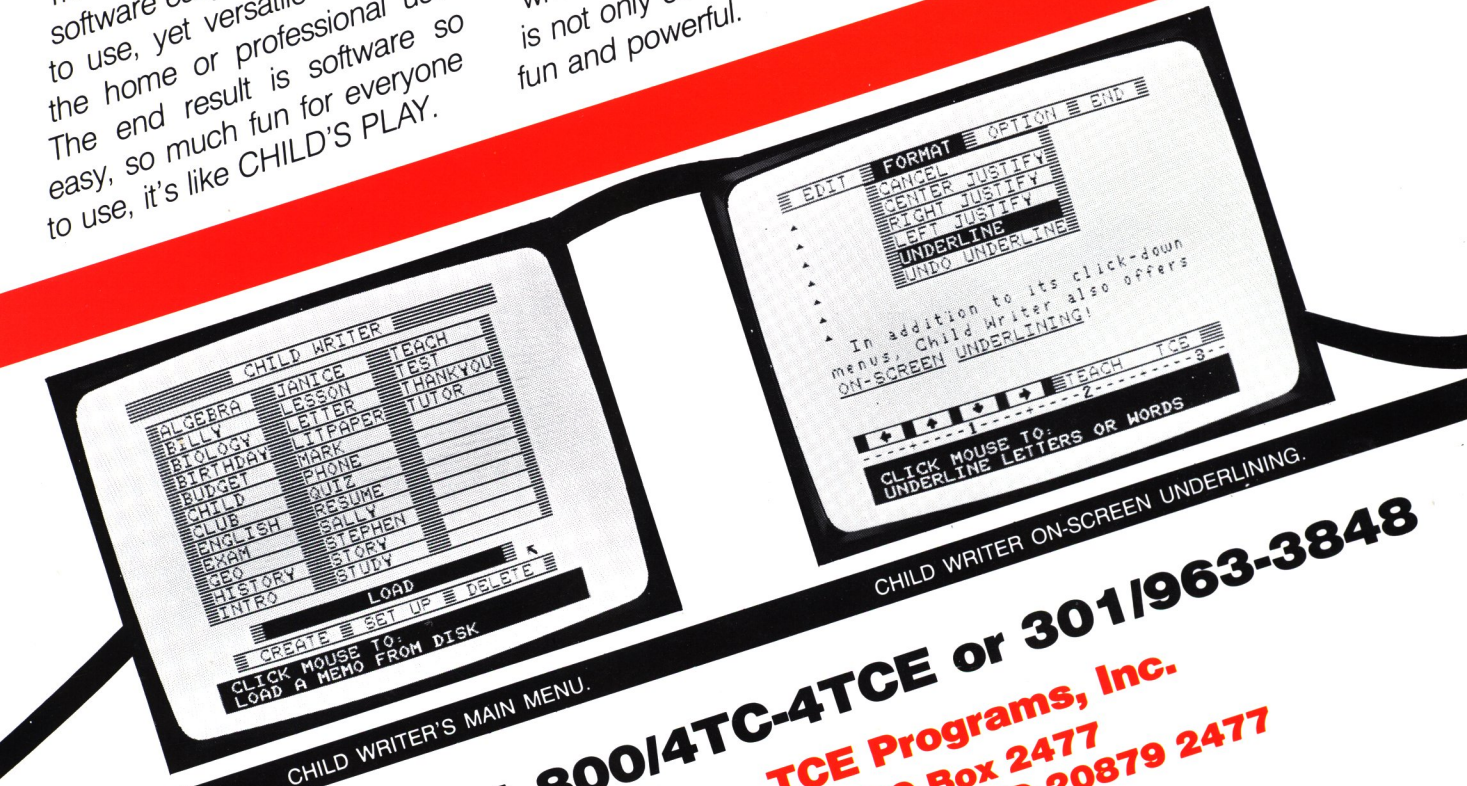
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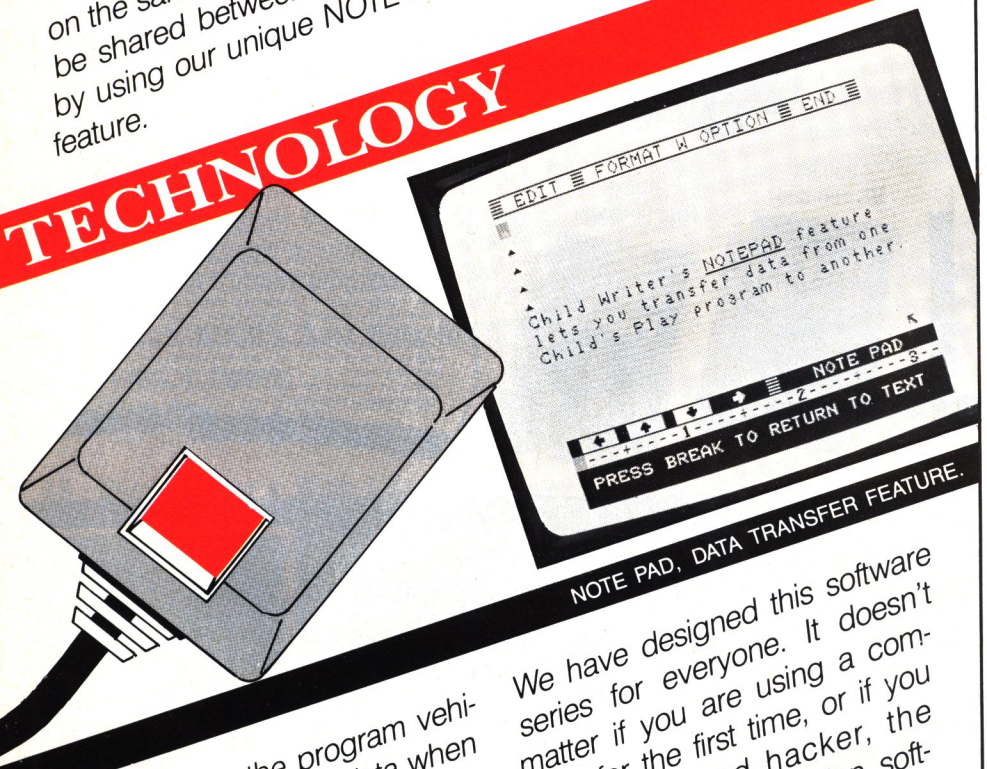
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TECHNOLOGY



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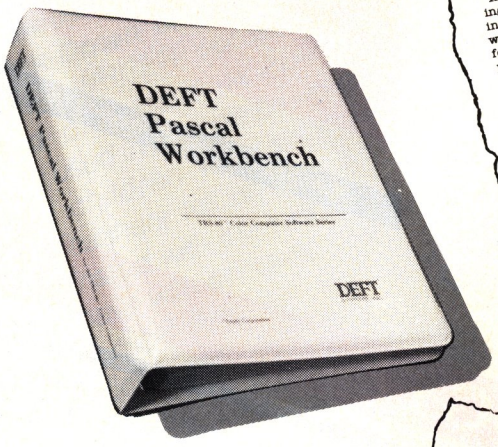
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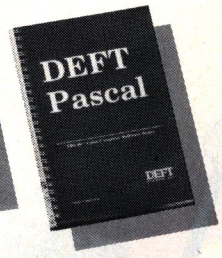
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HOT CoCo Magazine - (March 1985)

"What sets the DEFT product apart is the extent of its coverage. It provides the CoCo user with a very compatible implementation of standard Pascal, along with many useful extensions for string handling, absolute memory access, and the compilation of separate program modules. That's quite a feat for a system that can run on a 32K computer. DEFT's Pascal supports real (that is, floating-point) variables. Many CoCo aftermarket languages handle only integers; this Pascal gives you full-bore computation capability."

RAINBOW Magazine - (November 1984)

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"DEFT Bench and DEFT Pascal remain an excellent example of what can be accomplished in the CoCo world. The entire package gives you all the necessary tools to learn Pascal. If you already know Pascal, then it gives you a total development environment. Nothing is missing, there is nothing else to buy."
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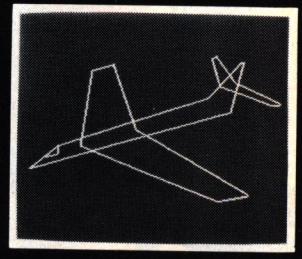
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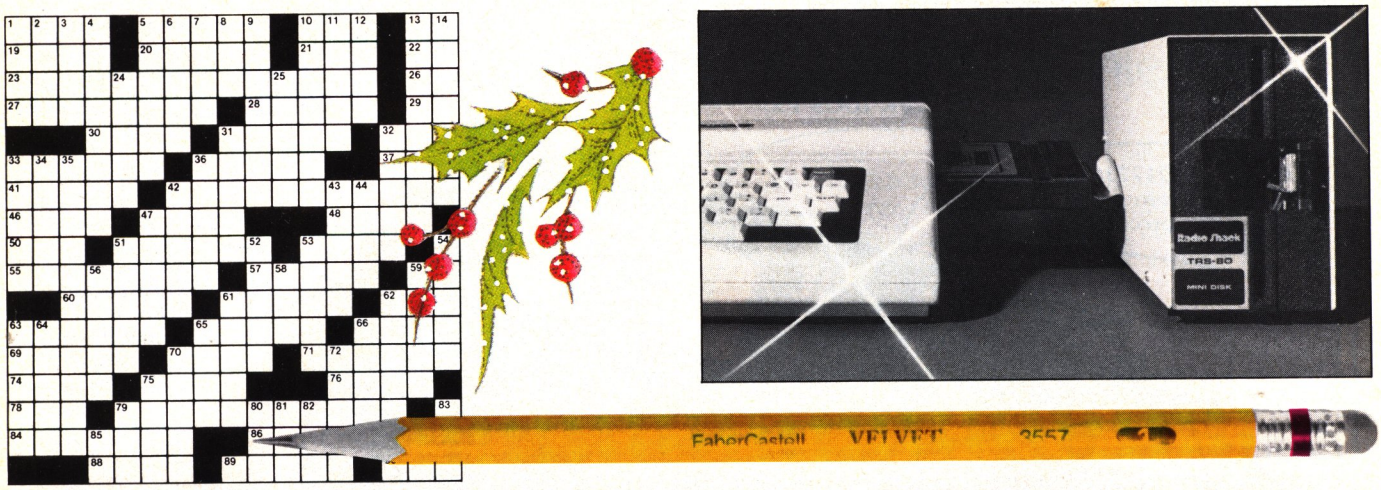
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Cover photo by Frank Cordelle

HOT CoCo

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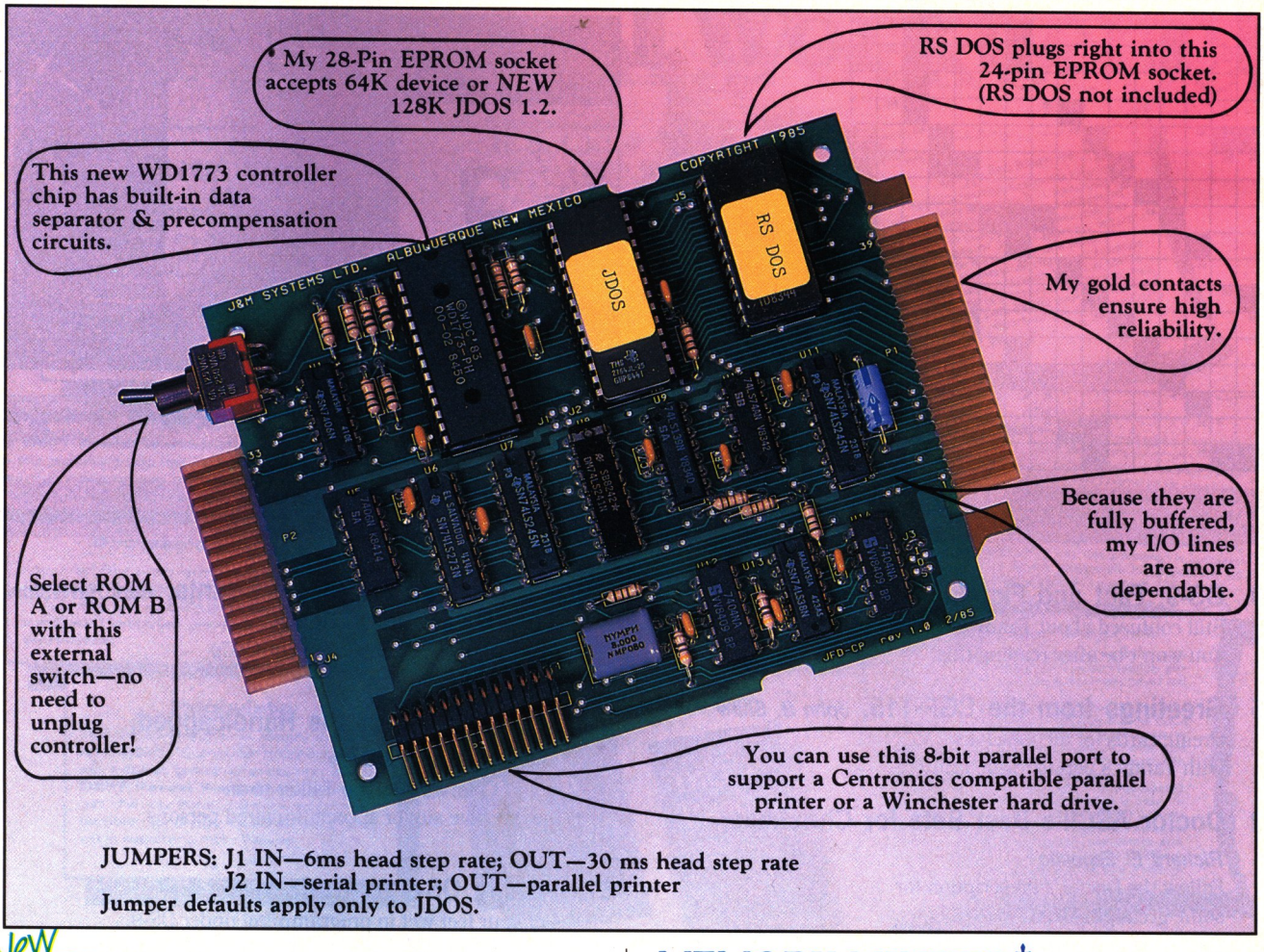
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Reader's Forum and 6809 On Line will return next month.

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Upgrade your Color Computer by adding our *new* JFD-CP disk controller, supercharged JDOS operating system, and a top quality drive with case and power supply: *All* for only $289! Comes complete with cable and manual.

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Drive 0,1 System with two double side drives . . $499

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508-200: Tests single side disk drives $26
508-400: Tests double side disk drives $33

Memory Minder is available on diskette for those who don't own a JFD-CP Controller with JDOS. Includes Dysan diagnostic diskette.

Single Side Memory Minder Package $79
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Editor-in-Chief
MICHAEL E. NADEAU
Managing Editor
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KEITH JOHNSON (INSTANT COCO)
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Art Director
HOWARD HAPP
Associate Art Director
ANNE FLEMING
Production Supervisor
LINDA DREW

Advertising Director
PETER MONTROSS
Advertising Coordinator
DEBORAH McNALLY
80 Pine Street
Peterborough, NH 03458
1-800-441-4403 or
1-603-924-9471
Advertising Representative
TAMARA DORIS

Manufacturing Manager:
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Graphic Services Manager:
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Film Preparation Supervisor:
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Digressions

An Open Letter to Lonnie Falk

The following letter is in response to an editorial by Lonnie Falk. For those of you who don't know the name, Mr. Falk is the editor of *The Rainbow* magazine, one of our competitors. Mr. Falk took exception in his October 1985 PRINT #-2 column to my statements from my September 1985 Digressions concerning the slump in home-computer sales. He claimed that those statements showed a lack of faith in the Color Computer on my part.

Dear Lonnie;

I'm sorry that my September editorial upset you. You missed my point, but that's not important. The key issue here is the role of the editorial in a system-specific computer magazine.

I believe that, as editor of HOT CoCo, *I should use Digressions to discuss issues and events of importance to Color Computer owners. If a general market trend affects the CoCo, I'm going to write about it, whether it's good or bad. If it's good, I'll praise those responsible; if it's bad, I'll suggest solutions and offer light at the end of the tunnel.*

I want my editorials to make people think, to motivate, and make my readers feel good about owning a CoCo.

I don't know what your philosophy is concerning your PRINT #-2 column, but I find your October editorial to be rather self-serving. The advice you seem to be offering is that HOT CoCo *isn't supportive enough of the Color Computer to deserve their patronage. But the folks at* The Rainbow, *on the other hand, are the only True Believers. Well, as we say here in New Hampshire, that's a bunch of horse manure.*

So which one of us is right? I prefer to let my readers decide. You have my permission to reprint in full my September 1985 editorial, with this letter, in The Rainbow. *If I have truly sinned against the CoCo, may all my readers drop their subscriptions.*

Those Boring Tandy TV Ads

The Christmas buying season is upon us, and that means that everyone in the home-computer business is looking for a big sales surge. By now, you've seen and heard the pitches from Commodore, Atari, Apple, and even Tandy. I haven't seen anything yet, as I am writing this in September. So I sit here hoping that Tandy has something more memorable planned for CoCo TV ads than in the past.

Last year's ads were, in a word, boring. They featured a pitchman who looked like a stand-in for the Man from Glad, and the ads gave the overall impression of the Radio Shack catalog, with only a little more animation. The CoCo was portrayed not as something fun and interesting, but as a cheap computer that your kids could use.

I see three main problems with those ads. First, they don't have a lasting impression. I would not recall those ads at all had I not been involved with the Color Computer. Second, the focus was not as clear as it could have been. The Commodore-64 ads leave no question as to why you would want to own one—to keep your kids from failing in school, to run your household better, and to have fun. Third, the format was inappropriate for the product.

The authority-figure pitchman works better when selling pain relievers or subscriptions to *U.S. News and World Report*. You don't see Tandy's competitors selling home computers that way. One of my favorite computer ads featured Alan Alda discussing the merits of the Atari home computer with a teenage boy. It was humorous, memorable, and told the viewer all the best reasons for owning an Atari—that's the way to pitch home computers. The CoCo deserves more imaginative ads.

Tandy's TV ads must stimulate the viewer. Last year's ads presented a dry rationale followed up with a low price. I hope that by the time you read this Tandy has spruced up its TV campaign for the CoCo. After all, the more new CoCos under Christmas trees this year, the better for all of us.—*Michael E. Nadeau* ■

HOT CoCo is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes 57 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's *Computerworld/Argentina;* Asia's *The Asian Computerworld;* Australia's *Computerworld Australia, Australian PC World, Macworld* and *Directories;* Brazil's *DataNews* and *MicroMundo;* China's *China Computerworld;* Denmark's *Computerworld/Danmark, PC World* and *RUN* (Commodore); Finland's *Mikro;* France's *Le Monde Informatique, Golden* (Apple), *OPC* (IBM) and *Distributique;* Germany's *Computerwoche, Microcomputerwelt, PC Welt, SoftwareMarkt, CW Edition/Seminar, Computer Business, RUN* and *Apple's;* Italy's *Computerworld Italia* and *PC Magazine;* Japan's *Computerworld Japan;* Mexico's *Computerworld/Mexico* and *CompuMundo;* The Netherland's *Computerworld Benelux* and *PC World Benelux;* Norway's *Computerworld Norge, PC World* and *RUN* (Commodore); Saudi Arabia's *Saudi Computerworld;* Spain's *Computerworld Espana, Microsistemas/PC World, Commodore World;* Sweden's *ComputerSweden, Mikrodatorn* and *Svenska PC;* the UK's *Computer Management, Computer News, PC Business World* and *Computer Business Europe;* Venezuela's *Computerworld Venezuela;* the US's *Computerworld, Hot CoCo, inCider, Infoworld, MacWorld, Micro Marketworld, PC World, RUN, 73, 80 Micro, Focus Publications* and *On Communications.*

Instant CoCo is a cassette tape containing the major programs from this issue of *HOT CoCo*. Its purpose is to save you the time and effort of typing long program listings into your Color Computer. You simply load the programs from the Instant CoCo tape using your cassette recorder. The instructions for operating each program are found in the corresponding *HOT CoCo* article. Both Basic and Assembly-language programs are included on the tape.

The Instant CoCo symbol appears in *HOT CoCo*'s table of contents and on the program listing for each article with a listing used on the Instant CoCo tape. As an added extra, each tape also contains a never-before-published Bonus Program, complete with instructions.

The directory below lists all programs included on this month's Instant CoCo cassette. Shown first are the name of the article with a descriptive blurb and its author, followed by the page number in this issue where the article appears. Next comes the file name of the program on cassette. Finally, there is a brief description of the Color Computer system needed to run the program.

This month's Instant CoCo cassette is available for just $11.47, including postage and handling, from **Instant CoCo, 80 Pine St., Peterborough, NH 03458.** See our ad on p. 64 for more details.

Instant CoCo Directory December 1985

Side A

Article Name/Author/Description	Page #	File Name	System
Copyright Statement	---	TITLE	16K CB
Mindbusters/Ramella	11	FLIP	16K ECB
Try Uncle Arnold's coin game		CROSSCUT	4K CB
Greetings from the CGP-115/Shaw	35	GREETING	16K CB
Make your own greeting cards		GRAPH	16K CB

Side B

Speaking Up for the Handicapped/Vassilopoulos	51	SPEECH	32K DECB
Use Colorware's Real Talker to help the handicapped communicate		EIGHTY	32K DECB
Crossword Creator/Murillo	69	CROSSWRD	16K ECB
Generate your own custom crossword puzzles.			

*****Bonus Program*****

Alphabet for Tots/Davis	---	ALPHABET	32K ECB
Your preschoolers will enjoy learning the alphabet with this program			

CB = Color Basic, DECB = Disk Extended Color Basic, ECB = Extended Color Basic, (m)—achine-language program (use CLOADM)

Back Issues

Yes, back issues of *HOT CoCo* are available for all months. This list shows the features in each issue:

October 1983—Animation techniques; ROM disassembly, part I.

November 1983—Nuclear submarine simulation; ROM-pack primer; banner printer.

December 1983—World capitals quiz program; talking spelling tutor; vocabulary-building program.

March 1984—How a disk stores information; create your own wordsearch puzzles; dental/medical bill balancer.

June 1984—Horse-racing and stock-market simulators.

July 1984—Do-it-yourself lowercase mod; variable cross-referencer; the game, Python.

August 1984—Basic OS-9 review; database manager program; graphics tutorials; hurricane tracker.

September 1984—Educational software buyer's guide; typing-teacher program; the CoCo as a marketing aid.

November 1984—Personal money manager program; disk-file protection utility.

December 1984—Disk-drive timer; disk drive maintenance tips; full-featured text-editing program.

January 1985—Spreadsheet program; stock-charting program; make fancy graphics with your printer.

February 1985—Drawing program; user's group list; Space Hawks game.

March 1985—Universal screen-dump program; POKE list; utilities.

April 1985—Telewriter-64 mods; modem comparison; satellite-tracking program.

May 1985—Sound digitization; blackjack program; disk-based smart terminal programs compared.

June 1985—How to install 64K in any CoCo; pie-chart program; custom fonts for Gemini printers.

August 1985—Graphics utilities; auto-line-numbering program; how to connect the CoCo to a Model 100.

You'll also find in each issue our regular features, reviews of popular software and hardware, and dozens of useful programs that are yours for the typing in.

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Tell them "I saw it in HOT CoCo."

Telewriter-64™

the Color Computer Word Processor

- **3 display formats: 51/64/85 columns × 24 lines**
- **True lower case characters**
- **User-friendly full-screen editor**
- **Right justification**
- **Easy hyphenation**
- **Drives any printer**
- **Embedded format and control codes**
- **Runs in 16K, 32K, or 64K**
- **Menu-driven disk and cassette I/O**
- **No hardware modifications required**

THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

...one of the best programs for the Color Computer I have seen...
— Color Computer News, Jan. 1982

TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64 × 24 and 85 × 24!! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

FEATURES & SPECIFICATIONS:

Printing and formatting: Drives any printer (LPVII/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminet, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dot-graphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

File and I/O Features: ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette auto-retry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

Editing features: Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

...truly a state of the art word processor... outstanding in every respect.
— The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs $49.95 on cassette, $59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The step-by-step tutorial will have your writing with Telewriter-64 in a matter of minutes.)

To order, send check or money order to:

Cognitec
704 N. Nob St.
Del Mar, CA 92014

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Add $2.00 for shipping & handling. CA residents add 6% state tax.

Now available at Radio Shack stores via express order.

Apple II is a trademark of Apple Computer, Inc.; Atari is a trademark of Atari, Inc.; TRS-80 is a trademark of Tandy Corp; MX-80 is a trademark of Epson America, Inc.

How to Use HOT CoCo

Each month *HOT CoCo* provides a number of program listings for you to type into your Color Computer and use. If you are new to computing, read this page for advice that will help you avoid problems often encountered when entering programs manually.

Know the Basics

Before you begin, you should be familiar with the basic operation of your Color Computer. Read the manual, and make sure you understand how to enter a program line, save a program to cassette or disk, and make corrections to a program line. Verify that the program you want to enter will run on your version of the Color Computer. You need to know the memory requirements, the type of Basic used (Color, Micro Color, Extended Color, or Disk Extended Color Basic), what peripherals might be needed, and in some cases whether a particular ROM version is needed.

All this information is provided in the System Requirements box included with each article that has a program listing. This box gives the minimum requirements to use the program. If, for instance, the box reads "16K RAM, Color Basic," the program should also work on 32K or higher, Extended or Disk Extended Color Basic CoCos. Optional equipment is listed as such. Once you've established that the program will work on your CoCo, read the article thoroughly. Sometimes it will include information vital to typing in the listing.

What You See Is What You Get

We print all Basic program listings 32 characters across—just as they appear on your video screen. Type in the listing exactly as it appears in the magazine, being particularly careful with spaces and punctuation. If you do this, the 32-character format will aid in proofreading what you have typed by letting you match beginning and ending characters on corresponding lines. If you have a line that ends on a character other than what appears in the magazine, go back and check for a typo. Also, don't mistake certain characters for others that look similar, such as a zero instead of the letter O, a comma for a semicolon, and so on.

Weird Characters

The up arrow indicates exponentiation on the Color Computer. Unfortunately, our printer prints a caret (^) instead. Be sure to type an up arrow in place of all carets in Basic program listings.

If All Else Fails

If you cannot get your typed-in listing to run after checking and double-checking for typos, you can ask us for help. Send a detailed description of your problem along with any error messages given. Ideally we'd like a printout of what you typed. Send a self-addressed, stamped envelope for the fastest reply. Sorry, but we cannot help you if you have modified the original program in any way. Write to ***HOT CoCo*, attn. Technical Editor, 80 Pine St., Peterborough, NH 03458.**■

DISKETTES AND COCO SOFTWARE

5.25" DISKS EACH 10-PACK $12.50-SSDD/DSDD $20-DSQD
American-made, guaranteed 100% quality, with Tyvek jackets, hub rings, and labels

CMODEM TELECOMMUNICATIONS PROGRAM $100-FLEX,OS/9
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menu-driven with terminal mode, file transfer, MODEM7, XON-XOFF, etc.
for COCO and non-COCO; drives internal COCO modem port up to 2400 Baud

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specify 6800,1,2,3,5,8,9/6502 version or Z80/8080,5 version
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DISK AND XBASIC UTILITY PROGRAM LIBRARY $50-FLEX
edit disk sectors, sort directory, maintain master catalog, do disk sorts, etc.

Computer Systems Consultants, Inc.
1454 Latta Lane, Conyers, GA 30207
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Michael E. Nadeau, 80 Pine Street, Peterborough, N.H. 03458

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Jeffrey D. DeTray

Letters to the Editor

Disk I/O for ROM 1.1

I have been reading *HOT CoCo* since its inception and have been especially interested in utilities written in machine language. I typed in the program accompanying Mark Goodwin's article on disk I/O (*HOT CoCo*, December 1984, p. 70) only to find that it would not work. I looked for a correction but was disappointed to see that the program was written for Disk ROM 1.0 (*HOT CoCo*. February 1985, p. 12).

Since the program wouldn't work for Disk ROM 1.1, I decided to modify it to suit my needs. To eliminate label-defined-twice errors, change BEQ A@ to BEQ C@ in line 0183 and A@ RTS Return to C@ RTS Return in line 0186. Then change the operand codes as shown below:

Line	Original Code	Change
0128	C956	CA04
0130	CB52	CC24
0132	CB52	CC24
0134	CB52	CC24
0136	CB52	CC24
0138	CB52	CC24
0142	CB52	CC24
0148	CB52	CC24
0150	CB52	CC24
0152	CB52	CC24
0154	CB52	CC24
0161	D148	D235
0166	C242	C25A

Thank you for an informative magazine.

R. N. Miller
Western Australia

Well-Matched Pair

Many thanks for the article by Leon Wigrizer on linking the CoCo and the Model 100 (*HOT CoCo*, August 1985, p. 38). I, too, found it frustrating dealing with Radio Shack when I wanted my two TRS-80s to talk. In fact, when I showed a Radio Shack employee (with whom I enjoyed an otherwise excellent relationship) the article, he scoffed and was certain he had a better way. As it turned out, Wigrizer's method seems to be the best way of mating the two. I employed VIP Terminal using this approach and had excellent results.

However, I do have one wish. I'd like a serial cable that functions like a Y cable so that I would not have to disconnect (and later reconnect) my serial DMP-105 printer every time I wanted my computers to communicate. A serial-to-parallel cable with a switchable serial extension would be fine, too.

I subscribe to both Color Computer magazines and would be in a panic without *HOT CoCo*.

Steve K. Dubrow Eichel
Philadelphia, PA

Biological Computer Applications

I am interested in computerized analysis of biological data, especially the comparison of DNA and protein sequences. I am also interested in using matrix theory and the modeling of stochastic processes, including the use of Markov chains, to analyze problems in genetics. Please contact me if you have similar interests.

David W. Johnson
Dept. of Entomology
Archer Road Lab, Bldg. 345
University of Florida
Gainesville, FL 32611

Green Screen for Telewriter

I was having difficulty determining how to change the text screen in Telewriter-64 from buff to green. After reading Scott Norman's solution for disk systems (*HOT CoCo*, July 1985, p. 18), I knew that I should be be able to modify the cassette version of Telewriter to do the same on my 64K CoCo 2. After experimenting, I found a solution. Load the first part of Telewriter-64 and edit line 60, inserting:

:POKE 61125,240

When you type RUN, you should get a green screen.

Thanks for a great magazine.

Richard G. Hendrick
Plainville, CT

Language Barrier

My son and I have owned a Color Computer for a few months, but here in Argentina I can't find books, computer magazines, or other Color Computer materials written in Spanish.

I would appreciate information on obtaining such publications. I am very happy with the Color Computer and think that it will become more widely available here. Thank you for your help.

Eduardo Carlos Verta
Ayacucho 687
1602 Florida, Buenos Aires
Argentina

Disk Conversion for the CGP-115

Disk users can convert John B. Shaw's Color Dump program for use with disk-drive systems by making the changes below.

```
70   'PICTURES ON DISK MUST BE IN
     BINARY
2000 '***LOAD GRAPHICS DISPLAY***
2010 PRINT"DO YOU HAVE A DISPLAY
     ON DISK?"
2040 PRINT"INSERT PICTURE DISK IN
     DRIVE 0 AND TYPE FILENAME"
2070 LOADM Q$
```

The program makes a nice picture but boy it is sloooow.

Charles Williams
Akron, OH

Surgery a Success

Mick McGuire's article, "Desk Surgery!" (*HOT CoCo*, March 1985, p. 52) was terrific. My desk and system are so much more organized. However, I had trouble with interference when I added my disk drive. I grounded the television box as McGuire instructed—to no avail. After checking out the cables, I realized that the picture cable was running in parallel with the power cable for the disk drive. I then took the picture cable and ran it horizontally along the back of the riser. Voila, no more interference. I hope this solution helps someone else.

James Connolly
P.E.I., Canada

Reading High-Speed Tapes

I have developed a short program for tape users. When I am operating in the high-speed mode using POKE65495,1, I sometimes forget to slow down before saving to cassette. The program below enables you to read tapes recorded at high speed or regular speed from the fast or regular mode of operation. It works on my D-board CoCo; test it if you have a different version of the CoCo.

```
1 CLS:INPUT"DO YOU NEED INSTRUCT
IONS Y/N";AN$
2 IF AN$="Y"THEN GOTO5ØØØ
1Ø CLS
1ØØ PRINT"SELECT AN OPTION":PRIN
T
11Ø PRINT"1) READ NORMAL SPEED T
APES WHILE   OPERATING AT NORMAL
 SPEED":PRINT
12Ø PRINT"2) READ NORMAL SPEED T
APES WHILE   OPERATING AT HIGH S
PEED":PRINT
13Ø PRINT"3) READ HIGH SPEED TAP
ES WHILE     OPERATING AT NORMAL
 SPEED":PRINT
14Ø PRINT"4) READ HIGH SPEED TAP
ES WHILE     OPERATING AT HIGH S
PEED":PRINT
2ØØ INPUT"WELL";AN
2Ø5 IF AN<1 OR AN>4 THEN2ØØ
21Ø ON AN GOTO1ØØØ,2ØØØ,3ØØØ,4ØØ
Ø,5ØØØ
1ØØØ POKE143,18:POKE144,24:POKE1
45,1Ø:END
2ØØØ POKE 143,29:POKE144,3Ø:POKE
145,15:END
3ØØØ POKE143,8:POKE144,24:POKE14
5,4:END
4ØØØ POKE143,13:POKE144,24:POKE1
45,6:END
5ØØØ CLS:PRINT"  IF YOU USE THE
HIGH SPEED POKE  (POKE65495,Ø) A
```

Listing continued

```
ND RECORD TAPES  WHILE IN THIS H
IGH SPEED MODE   THEN THE BAUD R
ATE WILL BE      DOUBLED."
5ØØ5 PRINT:PRINT"LISTEN TO SUCH
A TAPE. IT SOUNDSFASTER!"
5Ø1Ø PRINT:PRINT"THIS PROGRAM WI
LL ALLOW YOU TO READ HIGH SPEED
TAPES OR REGULAR SPEED TAPES IN
FAST OR SLOW MODE OF OPERATION."

5Ø2Ø PRINT:INPUT"PRESS ENTER";AN

5Ø25 CLS:PRINT"IT MAY NOT WORK O
N SOME MODELS OF THE COLOR COMPU
TER, SO IT IS BEST TO EXPERIMENT
 WITH IT A LITTLE."
5Ø3Ø PRINT:INPUT "PRESS ENTER";A
N
5Ø35 GOTO1Ø
```

Robert E. Laun
Croydon, England

SG-10 Review

Your review of the SG-10 printer (*HOT CoCo*, August 1985, p. 20) states that it is an excellent printer; I agree. However, I must point out a serious problem that your reviewer did not mention. The otherwise superb user's manual does not give assistance should anything go wrong. It does not have a troubleshooting section, parts drawings or lists, technical information (except specifications), or circuit diagrams. I had problems with mine and wrote to Star Micronics twice but have received no reply.

David Kincaid
Greenville, SC

The maintenance manual for the SG-10 provides the information you need. It costs $20 and should be available through the dealer who sold you the printer.—eds.

Clubhouse

Have a Color Computer club? Let prospective members know about it through a letter to the editor.

Kalamazoo, MI

The Greater Kalamazoo Color Computer Club meets the third Wednesday of each month in the Community Room of the Crossroads Mall. Meetings begin at 7:30 p.m. and are free of charge. The club publishes a newsletter and has a public-domain library containing 150 programs. For more information, call Mike at 657-3850 or Jim at 344-7631.

Michael Marcelletti
Paw Paw, MI

Lapeer, MI

A new computer user group called Tandy Users has formed in Lapeer, MI. Membership is open to users of all Tandy and Tandy-compatible computers. Meetings are held twice a month. Call 313-664-0261 for the latest information.

Wilfred H. Alspach
Columbiaville, MI

Staten Island, NY

The New York Color Computer Group meets the second Thursday of the month at 7:15 p.m. in the in-service room of the Clove Lakes Nursing Home, 25 Fanning St., Staten Island. For more information, send a self-addressed, stamped envelope to the New York Color Computer Group, Box 626, Staten Island, NY 10314.

Bill Bergadano
Staten Island, NY

Richmond, VA

The Richmond Color Computer User's Group meets the fourth Monday of every month. For information on the club or newsletter, *Cursor*, call 804-282-7778.

Bill Mays
Richmond, VA

Central Missouri

For information on the Color Computer User's Group in central Missouri, contact Eric (314-445-2974) or Phil (314-445-6536) in the evenings or on weekends.

Phil Smith
Columbia, MO

Goldsboro, NC

I am looking for Color Computer users in the Goldsboro/Wayne County area who want to start a CoCo club. Please contact me at home (778-7820) or on CompuServe (72207,1114).

Ray Fowler
208 Saddlewood Drive
Goldsboro, NC 27530

Southeast Holland

The newly formed CoCo Club Eindhoven meets every first and third Monday of the month in the Community House 'TSlot at Eindhoven's Suburb Gestel. Call 040-512222.

Jan Slaats
Chopinlaan 11
5653 ET Eindhoven, Holland

Mexico City

The MexCoCo User's Group now has 38 members. Call Sergio Waisser at 553-11-98 for further information.

Sergio Waisser
Pachuca 87-109
Mexico City, D.F.
Mexico 06140

New Zealand

The Christchurch Color Computer Club welcomes new members. The club, which already has 25 members, charges a small membership fee.

Miss W.A. Ross
50 Sandwich Road
Beckenham, Christchurch 2
New Zealand

AMATEUR RADIO SOFTWARE

BMC Color Monitor
with sound
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Specify CoCo 1 or 2

RAINBOW CERTIFICATION SEAL

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Circle Reader Service card #352

Check or M.O. to CYNWYN, 4791 Broadway, Suite 2F, New York, New York 10034 ● 3% shipping/handling, $2 minimum. New York residents add sales tax.

Mindbusters

by Richard Ramella



This program is available on our Instant CoCo cassette.
See the Instant CoCo ad elsewhere in this issue.



Uncle Arnold's Coin Game



Uncle Arnold was a middle-aged bachelor. Florid of face and bereft of fixed address, he existed by making the rounds of relatives' homes for visits that always seemed to last one day too long. Time had blurred the distinction of his belonging to one side of the family or the other, and neither one claimed him.

The adults in the family put up with his excesses and his wild tales because he was adored by the children. And he was wily enough to capitalize on that. When I was 10 years old, he and I shared the same emotional outlook. He was superior to me only in that he was a child who had brought back from the world a vast sample of jokes, magic tricks, games, and puzzles. No one ever left the dinner table until uncle Arnold showed his latest coin game. He never seemed to have any money except coins, and he always offered them as a prize for the right answer. I won only once.

"I have in my hand five dimes and five nickels," he had said to no one in particular. Then he shot me a glance, "Total?"

"75 cents!" *Was that the answer? Did I win the money?* Not yet. Uncle Arnold called for a pencil and a sheet of paper, on which he drew a line of 12 boxes. Then he placed the the coins, alternating dime—nickel—dime, in the first 10 boxes.

"You have five moves to rearrange these so that the dimes and nickels are ordered in separate groups of five," he explained. "And on each move you must select two adjacent coins and place them in the two empty boxes."

"Beats me," said my father, who always feigned ignorance to escape involvement. My mother nudged me, the signal for the boy genius to give it a try. My uncle was smiling faintly. Then I reached out and worked the puzzle perfectly on the first try, and the color drained from his face.

My father laughed and told him, "You did that puzzle last time, Arnold; he's been practicing it ever since." And in all the many times that uncle Arnold came to visit after that, he never again offered a coin puzzle. But I suggest you learn the answer to this one. You never can tell when uncle Arnold might show up on your doorstep.

Flipdoodle

When you run Program Listing 1, the word Flipdoodle is drawn on the screen as a title. Above that, the program draws 12 boxes in a horizontal row with the first 10 containing alternating orange and green circles. Beneath the boxes is a linear, white cursor that spans two boxes. Pressing the left and right arrow keys moves the line one box in either direction. Pressing the space bar moves the two boxes underlined by the cursor to the two empty boxes. Each time you press the space bar, a vertical line appears in the upper left corner to keep track of the number of moves you make.

The object of Flipdoodle is to separate the circles by color in two contiguous groups. The two groups may or may not be touching, but all of each color's circles must be touching. When you have separated the colors as described, the word Flipdoodle will begin flipping on the screen. The puzzle can be solved in five moves, although I don't expect you'll solve it in five moves today. If you do solve it in five moves, random tones will sound signifying that you have won. Press the break key to escape.

Puzzle Contest VIII—Crosscut

Remembering how uncle Arnold used to ruin the Sunday crossword puzzle by filling it with nonsense words, I got the idea for this month's puzzle, called Crosscut. It works with any 16K Color Computer and on the MC-10 with the change shown in line 120.

At the start of a run of Crosscut, which is Program Listing 2, the screen is divided by a vertical blue line. On the right is the pool of letters you may use to form words. At the left is the green play area, empty except for a flashing orange cursor in the northwest corner. The cursor can be moved around the playing area by pressing the four arrow keys.

The object of Crosscut is to score as many points as possible by forming interlocked words, as in a crossword puzzle. Use the arrow keys to select a location. To set a letter in place, press its key on the keyboard. It will appear on the cursor location in the play area and a black square will cover one of the instances of the letter in the square of unused letters to the right. Notice that not all letters of the alphabet are available.

Only English words are acceptable. Plurals are allowed, but proper names, abbreviations, and hyphenated words are not. Words may be used more than once. All words must be connected or intertwined as part of a single network of letters. Words that are separated from this network are illegal. The acceptability of words will be judged according to the rules mentioned above and *Webster's Third International Dictionary*. The scores of letter groupings judged to be illegal words will be removed from entries. If this breaks the continuity of an entry's network, the entry will be disqualified.

The following is an example of legal network connections. The horizontal words are *pat*, *are*, and *stars*. The vertical words are *pass*, *art*, *tea*, and *ease*. Wherever letters touch one another horizontally or vertically, they must form a word.

```
P A T   E
A R E   A
S T A R S
S       E
```

Scoring is awarded as one point for every letter that appears legally in the play area. This is added to the result of a second scoring routine, which finds every box containing a letter and then adds a point for each lettered box directly contacting one of its four sides. The second scoring routine does not examine letters in the one-box outline that forms the four-sided periphery of the play area. Press the * key to see a score, which will be totaled and displayed at the bottom of the screen. To record your score, make a 15-by-15 grid and write in the letters. Below the grid, write your name, full address, and score.

This month, Mindbusters is pleased to announce that the winner of Puzzle Contest

System Requirements

16K RAM
Extended Color Basic
Color TV or Monitor

III—Alphasequence is Abe Feigenbaum of Hopatcong, NJ, who will receive a free one-year subscription to *HOT CoCo*. He had the high score of 474 with the words: *abhors, adopt, aglow, almost, begins, begirt, bijoux, biopsy, chimps, chintz, deity, dirty, empty, forty,* and *ghosty*. Congratulations, Abe!

Norman Young of Media, PA, tied Abe Feigenbaum's score, but was found to be the runner up in a random drawing. Although he did not find five of the words that Abe Feigenbaum found, he did find five of his own originals. They are *abort, adept, below, chinos,* and *first*. Both of these two entrants are first-class puzzle busters. There were numerous other entrants; many came close to the high score. I wish I had room to mention them all. ■

Eds. note—To enter Puzzle Contest VIII, send the grid described above to Richard Ramella, 1493 Mt. View Ave., Chico, CA 95926. Write your score on the outside of the back flap of your envelope. Entries must be postmarked by December 31, 1985. The winner will be the entrant with the highest score. In the event of a tie, the winner will be selected at random. The winner will receive a free one-year subscription or extension to HOT CoCo. *The winner's name and solution will appear in a future Mindbusters column.*

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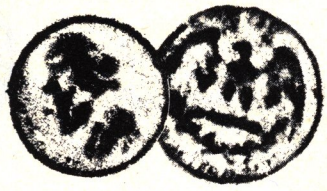
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Program Listing 1. Uncle Arnold's Coin Game

```
100 REM * FLIPDOODLE * TRS-80 EX
TENDED COLOR BASIC 16K
110 REM * MINDBUSTERS / BY RICHA
RD RAMELLA
120 PMODE 1,1: PCLS1: SCREEN 1,1
: POKE 65314,249
130 L$=CHR$(8): R$=CHR$(9): Z$=C
HR$(32): DIM K(4,16)
140 LINE(30,120)-(180,160),PSET,
BF
150 COLOR 1,0: DRAW"BM40,126;R12
L12D12R10L10D12"
160 DRAW"BM58,126;D24R2C0R7C1U12
C0U2C1U1"
170 DRAW"BM74,140;D16U16R10D10L1
0"
180 D$="D24L10U10R10": DRAW"BM10
0,126;"+D$
190 O$="R10D10L10U10": DRAW"BM10
6,140;"+O$: DRAW"BM122,140;"+O$
200 DRAW"BM148,126;"+D$: DRAW"BM
155,126;D24"
210 DRAW"BM160,144;R10U4L10D10R1
0": COLOR 4,1
220 FOR X=6 TO 226 STEP 20: DRAW
"BM"+STR$(X)+",50;R20D20L20U20":
 NEXT
230 FOR X=16 TO 196 STEP 40: CIR
CLE(X,60),7,2: PAINT(X,60),2,2
240 CIRCLE(X+20,60),7,3: PAINT(X
+20,60),7,3: NEXT: X=6
250 LINE(X,80)-(X+40,80),PSET
260 X1=X: A$=INKEY$: IF A$<>L$ A
ND A$<>R$ AND A$<>CHR$(32) THEN
260
270 LINE(X1,80)-(X1+40,80),PRESE
T
280 IF A$=L$ THEN X=X-20: IF X<6
 THEN X=206
290 IF A$=R$ THEN X=X+20: IF X>2
06 THEN X=6
300 IF A$=CHR$(32) THEN GOSUB 32
0
310 LINE(X,80)-(X+40,80),PSET: G
OTO 260
320 L=PPOINT(X+10,60): R=PPOINT(
X+30,60): IF L=5 OR R=5 THEN RET
URN
330 FOR H=16 TO 216 STEP 20: IF
PPOINT(H,60)<>5 THEN NEXT
340 CIRCLE(H,60),7,L: PAINT(H,60
),L,L
350 CIRCLE(H+20,60),7,R: PAINT(H
+20,60),R,R
360 PAINT(X+7,55),1,0: PAINT(X+2
7,55),1,0: C=C+1: LINE(C*4,5)-(C
*4,15),PSET
370 FOR H=16 TO 236 STEP 20: X$=
X$+RIGHT$(STR$(PPOINT(H,60)),1):
 NEXT
380 IF INSTR(X$,"66666")>0 AND I
NSTR(X$,"77777")>0 THEN 390 ELSE
 X$="": RETURN
390 IF C<6 THEN SOUND RND(100),1
400 GET(30,120)-(181,160),K: PUT
(30,120)-(181,160),K,NOT: GOTO 3
90
410 REM * END OF LISTING
```

Program Listing 2. Crosscut

```
100 REM * CROSSCUT PUZZLE CONTES
T * TRS-80 COLOR BASIC AND MC-10
 BASIC
110 CLS: CLEAR 500: DIM A$(7),P(
4)
120 PK=1024: ' MC-10 MAKE THIS P
K=16384
130 U$=CHR$(94): D$=CHR$(10): L$
=CHR$(8): R$=CHR$(9)
140 A$(1)="AAAAAAAAAAAAAAA"
150 A$(2)="AEIOUAEIOUAEIOU"
160 A$(3)="IIIIIIIIIIIIIII"
170 A$(4)="OOOOOOOOOOOOOO"
180 A$(5)="UUUUUUYYYYYYYYY"
190 A$(6)="BBCDDFGHLLMMNNN"
200 A$(7)="PPQRRSSTTVWWXYZ"
210 FOR X=1 TO 15: X$=X$+CHR$(32
): NEXT
220 X$=X$+CHR$(175)
230 FOR X=1 TO 5: PRINT @ J,X$+A
$(X);: J=J+32: NEXT
240 FOR X=1 TO 5: FOR Z=6 TO 7
250 PRINT @ J,X$+A$(Z);: J=J+32:
 NEXT Z,X
260 FOR X=480 TO 511: POKE PK+X,
175: NEXT
270 A$=INKEY$
280 IF A$="*" OR A$=":" THEN GOS
UB 460: GOTO 270
290 Z=PEEK(PK+A+B)
300 K=PK+A+B
310 POKE K,255
320 IF A$=U$ THEN B=B-32
330 IF A$=D$ THEN B=B+32
340 IF A$=L$ THEN A=A-1
350 IF A$=R$ THEN A=A+1
360 IF A<0 THEN A=0
370 IF A>14 THEN A=14
380 IF B<0 THEN B=0
390 IF B>448 THEN B=448
400 POKE K,Z: IF A$="" THEN 270
410 L=ASC(A$): IF L<65 OR L>90 T
HEN 270
420 FOR M=16 TO 464 STEP 32: FOR
 N=0 TO 14
430 V=PEEK(PK+M+N)
440 IF A$=CHR$(V) THEN POKE K,V:
 POKE PK+M+N,32: GOTO 270
450 NEXT N,M: GOTO 270
460 FOR M=0 TO 448 STEP 32: FOR
N=0 TO 15
470 P=PEEK(PK+M+N): IF P<65 OR P
>90 THEN 490
480 SC=SC+1
490 NEXT N,M
500 FOR M=33 TO 417 STEP 32: FOR
 N=0 TO 13
510 P=PEEK(PK+M+N): IF P<65 OR P
>90 THEN 560
520 P=PK+M+N: P(1)=PEEK(P-32)
530 P(2)=PEEK(P+32): P(3)=PEEK(P
-1): P(4)=PEEK(P+1)
540 FOR X=1 TO 4: IF P(X)>64 AND
 P(X)<91 THEN SC=SC+1
550 NEXT X: FOR Z=1 TO 4: P(Z)=0
: NEXT Z
560 NEXT N,M
570 PRINT @ 482,"SCORE: "SC;: SC
=0: RETURN
580 REM * END OF LISTING
```

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Doctor ASCII

by Richard E. Esposito and Ralph E. Ramhoff

Q. Is there a 600- by 400-pixel VDG chip that I could install in my Extended Basic CoCo 2, or could I double up my graphics memory and address it with windows? Is there an inexpensive light pen for the CoCo?—***Steve Brill, Phoenix, AZ***

A. That resolution would require 600 x 400 = 240,000 bits, or 30K of RAM for a monochrome display. Multiply that figure by the number of colors available. You would have to increase the CoCo's memory beyond 64K and add Motorola's RMS chip set, or you could add a device with its own built-in memory similar to PBJ's Word-Pak. In Basic, you could enter a PCLEAR 8, which gives you two 6K hi-res screens. You can switch between them via the SCREEN command. Speech Systems (38W 255 Deerpath Road, Batavia, IL 60510, 312-879-6880) sells the Datapen light pen for $29.95. And Colorware (78-03F Jamaica Ave., Woodhaven, NY 11421, 800-221-0916) sells its light pen for $24.95 with software.

Q. How do I know what information to POKE into an address to change the course of computer destiny?—***Joseph McElroy, Dorchester, MA***

A. Early CoCo hackers did it by disassembling the code in the CoCo's ROM. It's easier for newcomers, since Spectral Associates (3418 S. 90th St., Tacoma, WA 98409, 206-581-6938) markets the code for the CoCo's three ROMs already disassembled for $19.95 each, or $49.95 for the set. Mark D. Goodwin's 10-part "Journey to the Center of the ROM" (*HOT CoCo*, October to November 1983 and January to August 1984) provides the disassembled code and a disassembler, as well as explanatory text.

But even with the disassembled code in hand, you must be able to read through it and understand what makes it tick. Then in a moment of inspiration, you can think of a way to alter the code to make the CoCo do something it "can't."

Q. Is there any way to use my disk drive instead of tape to up- and download data via Tandy's Deluxe RS-232 Program Pak and Multi-Pak Interface without resorting to OS-9 or Flex?—***G.P. Wright, Wilmington, NC***

A. Cer-Comp (5566 Ricochet Ave., Las Vegas, NV 89110, 702-452-0632) sells Data Pack II on disk. It bypasses the RS-232 Pak's resident ROM so you can communicate without losing your disk drive. It also lets you optionally hook up Word-Pak and a printer, giving you an 80-column display, printing, and disk access at the same time. It is backup-protected on disk, and sells for $44.95.

Q. Can I turn off the border on a PMODE 4 screen so that it is totally dark?—***Joe Wainwright, Boulder, CO***

A. Sorry, but Motorola made a design decision on the CoCo's 6847 video-display generator to have either buff or green borders when using any of the hi-res modes.

Q. I've heard of utilities that retrieve a killed file as long as it hasn't been written over. Where can I get such a program?—***Harold Buckelew, Milltown, NJ***

A. See David Meredith's "Disk Data Recovery," *HOT CoCo*, September 1985, p. 55.

Q. I have the game, Trivia Fever, which runs under OS-9. How can I make the game auto-execute when I boot OS-9?—***Stacy Chambles, Jacksonville, AL***

A. Use FORMAT and then OS9GEN or COBBLER to create a new OS-9 system disk. Create a CMDS directory on it and copy over whatever routines you need to run Trivia Fever. Then create a STARTUP file that contains the instruction sequence needed to bring up your game using BUILD or the OS-9 EDIT. You could do this for almost any OS-9 program, dedicating a disk to Basic-09, another to Pascal, and so on.

Q. My LA36 DECwriter II almost works with my CoCo. I do not get line feeds with carriage returns, however. Do you have a patch for me?—***Harry C. Jung, Oregon, OH***

A. Back in 1981, when the CoCo was still just a baby, a call to Radio Shack's then toll-free service number would have got you this Basic POKE routine to correct the problem:

```
100 REM *** PRINTER LINE FEED PA
TCH ***
110 DATA 52,20,214,111,193,254
120 DATA 38,11,129,13,38,7,190
130 DATA 160,2,173,3,134,10,53
140 DATA 20,57
150 FOR D=1000 TO 1021
160 READ E:POKE D,E:NEXT D
170 POKE 1021,PEEK(359)
180 POKE 1022,PEEK(360)
190 POKE 1023,PEEK(361)
200 POKE 359,126:POKE 360,3:POKE
361,232
```

Q. I just upgraded my old E board CoCo with the new Tandy thin-line drive. Now with my drive plugged in, POKE 65495,0 hangs up the machine.—***Serge Loranger, Orleans, Ontario***

A. Clipping capacitor C85 on the computer corrects the problem in most CoCos of your vintage.

Q. The LIST-disable POKE 383,158 has helped my programming greatly, but how do I reenable it when I need to?—***Jim Underwood, Clarkston, GA***

A. PEEK(383) before you do your POKE. Then POKE that value back into 383 to reenable the LIST command. On my machine, it is POKE 383,126.

Q. How do you make a program determine when the joystick fire button is pressed?—***Chris Garrett, Moffat, Ontario***

A. To read the fire button, you must PEEK(&HFF00). The value returned will be 127 or 255 if neither fire button is pressed, 126 or 254 if the right joystick button is pressed, 125 or 253 if the left button is pressed, or 124 or 252 if both are pressed. You cannot depend on bit 7 of this byte to be set or clear at any specific time. You could logically AND the number returned by the PEEK with 3 to get rid of the ORs above. The following program demonstrates the latter technique for reading the fire button:

```
10 CLS
20 IF (1 AND PEEK(&HFF00)) = 0 T
HEN PRINT@0,"RIGHT" ELSE PRINT@0

30 IF (2 AND PEEK(&HFF00)) = 0 T
HEN PRINT@32,"LEFT" ELSE PRINT@3
2
40 GOTO 20
```

Q. In your August 1985 column, you mentioned *Undercolor* as another CoCo magazine. Can you send me its address and subscription rates?—***H.W. Gear, Washington, PA***

A. Dennis Kitsz's *Undercolor* was an attempt to continue *The Color Computer Magazine*. Unfortunately, it, too, folded with its eleventh issue, dated June 30, 1985. At this writing, the complete set of back issues is available for $15. The address is ColorPlus Inc., Box 6809, Roxbury, VT 05669. Subscribers will have the remainder of their subscriptions fulfilled by *The Rainbow* magazine.

Q. I had a problem with my Gorilla Banana printer similar to Milagros Rivera Diaz's mentioned in your August 1985 column. I traced it to the printer's default baud rate, which was 1,200 instead of the CoCo's 600. I discovered this by POKEing 150 with a 41. My dealer exchanged the printer's ROM with one set up for 600-baud operation, and I no longer need the POKE.—***Anthony Jacobs, Demopolis, AL***

A. Thanks for the information.

Q. How do I position the cursor anywhere on the screen and enter data from that position via the keyboard?—***Randy Williams, Lancaster, OH***

A. Text screen memory includes addresses 1024 to 1535. Addresses 136 and 137 control cursor position. Suppose you wanted to put the cursor at position P. The POKE value for address 136 would be INT(P/256), and the POKE value for address 137 would be P-256*INT(P/256). The statement POKE 136,4:POKE 137,0:INPUT X puts the cursor at the top left of the screen and solicits input for variable X.

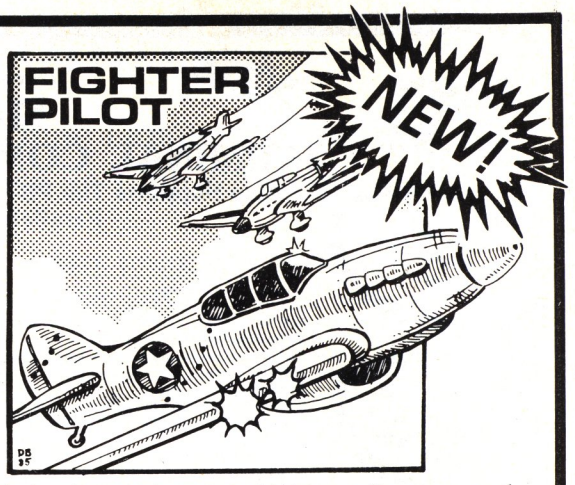
Q. Where can I get information on the Dragon computer, and which British publication supports it?—***Fred Burgess, Gaylord, MI***

A. The magazine is *Dragon User*. My counterpart there is Brian Cadge, who writes "Dragon Answers." The address is 12/13 Little Newport St., London WC2R 3LD. A subscription for anyone in the U.S. or Canada costs $33.95.

Q. When I use a hi-res screen with my modem program, a ripple crosses the screen from bottom to top every time the screen scrolls up one line. When I use the standard 32 by 16 display, this doesn't happen. Why?—***Bruce Rawls, Plymouth, FL***

A. It's due to the software for the hi-res screen. It needs to deal with 6,166 bytes of screen memory, whereas the normal display has only 512 bytes to deal with. The ripple is still there with a normal display; it just occurs too fast to be noticed. Possible solutions include adding an 80-column device such as PBJ's Word-Pak, a program with more efficient coding, typing POKE 65495,0, and halving the baud rate (if the RS-232 routine from ROM is used and memory map 1 is not enabled).

Having technical difficulties? Consult the Doctor for an answer. Due to the volume of mail Doctor ASCII receives, we cannot guarantee that your query will be published. Please send a self-addressed, stamped envelope with all letters to Doctor ASCII, c/o HOT CoCo, 80 Pine St., Peterborough, NH 03458.



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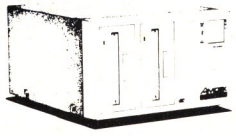
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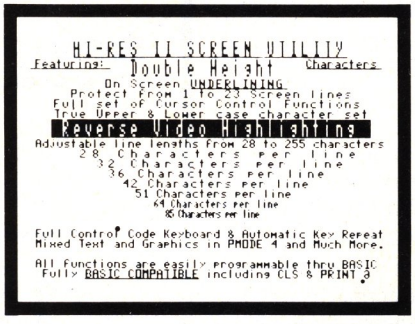
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Upper/Lower case characters	Yes	Yes	Yes
Mixed Text and Graphics	Yes	Yes	Yes
Separate Text & Graphics	Yes	Yes	No
Print @ fully implemented	Yes	Yes	Yes
Print @ on all line lengths	Yes	Yes	51 only
Different line lengths	28 to 255 (9)	28 to 255 (9)	51 only (1)
Automatic Key Repeat	Yes	Yes	Yes
Adjustable Key Repeat	Yes	No	No
Auto Repeat Disable	Yes	No	No
Erase to end of line/screen	Yes	Yes	Yes
Home Cursor	Yes	Yes	Yes
Solid or Blinking Cursor	Yes	No	Yes
CLS command supported	Buff/Biack	Buff/Black	Buff/Black
X,Y Coordinate Cursor Positioning	Yes	Yes	No
Double Size Characters	Yes	Yes	No
Individual/Continuous Highlighting	Yes	Yes	No
On Screen Underlining	Yes	Yes	No
Clear Key functional	Clear/L keys	Clear key	No
16,32 & 64K Supported	Yes	Yes	Yes
Green or Black Background Color	Yes	No	No
Dual Character sets for Enhanced 64 and 85 Characters per line display	Yes	No	No
Protected Screen Lines (programmable)	1 to 23	No	No
Full Control Code Keyboard for Screen control directly from the keyboard	Yes	No	No
Programmable Tab Character Spacing	Yes	No	No
Full Screen Reverse Function	Yes	Yes	No
Switch to & from the Standard 16 by 32 Screen for full compatability	Yes	No	No
On Error Goto Function	No	No	Yes
Extended Basic Required	No	Yes	Yes
All Machine Language Program	Yes	Yes	Yes
RAM Required in addition to Screen RAM	2K	2K	2K
Program Price (Tape)	$24.95	$19.95	$29.95

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"The CBASIC Compiler"

Now anyone can create fast efficient Machine Language Programs Easily and Quickly without having to use an Editor/Assembler

CBASIC is a fully integrated, easy to use Basic program Editor and Compiler package. CBASIC is 99% syntax compatible with Disk Extended Color Basic programs, so most Basic programs can be loaded and compiled by CBASIC with little or no changes required. The compiler is an optomizing two-pass integer Basic compiler that can convert programs written in Disk Extended Color Basic into 100% pure 6809 Machine Language programs which are written directly to disk in a LOADM compatible format.

The programs generated by the compiler can be run as complete stand alone programs. A built-in linker/editor will automatically select one and only one copy of each subroutine that is required from the internal run-time library and insert them directly in the program. This eliminates the need for cumbersome, often wasteful separate "run-time" packages.

CBASIC WAS DESIGNED FOR BOTH BEGINNING & ADVANCED USERS

CBASIC is a Powerful tool for the Beginner or Novice programmer as well as the Advanced Basic or Machine Language programmer. The Beginner or Novice programmer can write and compile programs without having to worry about Stack Pointers, DP registers, memory allocation, and so on, because CBASIC will handle it for you automatically. All they have to do is write their programs using the standard Basic statements and syntax. For the advanced Basic and Machine Language programmers, CBASIC will let you take command and control every aspect of your program, even generating machine code directly in a program for specialized routines or functions.

CBASIC adds many features not found in Color Basic, like Interrupt, Reset, and On Error handling. It also has advanced programming features that allow machine level control of the Stack and Direct Page registers, variable allocation, automatic 64K RAM control, program origin and even multiple origins. It can even have machine language code generated within a program that executes just like any other Basic program line.

FULL COMMAND SUPPORT & SPEED

CBASIC features well over 100 Basic Commands and Functions that fully support Disk, Tape, Printer and Screen I/O. It also supports ALL the High and Low Resolution Graphics, Sound, Play and String Operations available in Extended Color Basic, and all with 99.9% syntax compatibility.

CBASIC is FAST. Not only will CBASIC compiled programs execute 10 to 1000 times faster than Basic, but the time it takes to develop a CBASIC program versus writing a machine language program is much, much shorter. A machine language program that might take several months to write and debug could be created using CBASIC in a matter of days or hours, even for a well experienced machine language programmer. We had a report from a CBASIC user that claimed "a Basic program that used to take 3 hours to run, now runs in 7 to 8 minutes". Another user reported a program that took 1 to 1½ hours to run in Basic, now runs in 5 to 6 minutes!!!

MORE THAN JUST A COMPILER

CBASIC has its own completely integrated Basic Program Editor. The Editor contained in CBASIC is used to Create and/or Edit programs for the compiler. It is a full featured editor with functions designed specifically for writing and editing Basic programs. It has built-in block Move and Copy functions with automatic program renumbering. Complete, easy to use inserting, deleting, extending and overtyping of existing program lines. It is also used for Loading, Saving, Appending (merging), Killing disk files and displaying a Disk Directory. It also has automatic line number generation for use when creating programs or inserting sequencial lines between existing lines. You can set the printer baud rate and direct normal or compiled listings to the printer for hard copy. The built-in editor makes program corrections and changes as easy as "falling off a log". If CBASIC finds an error when compiling, it points to the place in the program line where the error occurred. All you have to do is tell the editor what line you want to start editing and when it is displayed, move the cursor with the arrow keys to the place where the error is and correct it. Just like that, it's simple.

HI-RES & 80 COLUMN DISPLAYS

CBASIC is the only Color Basic Compiler that includes its own Hi-Resolution 51, 64 or 85 by 24 line display. It is also the only compiler that supports both the PBJ "Word-Pak" and the Double Density 80 column cards. All of these display formats are part of the standard CBASIC compiler package. Not only can these display formats be used for normal program editing and compiling, but CBASIC will also include them in your compiled programs! If you want CBASIC to include the display driver in your program, all you have to do is use a single CBASIC command "HIRES". The run-time display driver that CBASIC includes in your program is not just a simple display, but a full-featured display package. With the Hi-Resolution display package you can mix text & graphics, change characters per line, underline, character highlight, erase to end of line or screen, home cursor, home & clear screen, protect screen lines, and much more. All commands are compatible with our HI-RES II Screen Commander so you can easily develop screen layouts using HI-RES and Color Basic before you compile your program. The same applies to using the 80 column card drivers. What other Basic compiler offers you this kind of flexibility?

64K RAM SUPPORT

CBASIC makes full use of the power and flexibility of the 6883 SAM (Synchronous Address Multiplexer) in the Color Computer. It will fully utilize the 96K of address space available in the Color Computer (64K installed) during program Creation, Editing and Compilation. CBASIC has a special command for automatic 64K RAM control. When used in a program, it allows the user to use the upper 32K of RAM space automatically for variables or even program storage at run-time. It will automatically switch the ROMs in and out when needed. There are also two other commands that allow you to control the upper 32K of RAM manually, under program control. No other Color Basic compiler directly supports the use of 64K RAM like CBASIC.

ALL MACHINE LANGUAGE

CBASIC is completely written in fast efficient Machine Language, not Basic, like some other Color Basic compilers. Because of this, CBASIC can edit and compile very large programs. Even using the Hi-Resolution 51 by 24 line display, it can work with about a 34K program, and the 80 column card versions can handle almost 40K of program. Some of the other Basic compilers can only work with 16K or about 200 lines. Even working with large programs, CBASIC compiles programs with lightning fast speed. It will compile a 24K program to disk in less than 2 minutes! That's without a listing being generated. We've heard stories about some other compilers that take almost 10 minutes to compile a simple 2-3K program. You might inquire about this when you look at some of the other compilers available.

THE FINISHED PRODUCT

Since CBASIC contains statements to support ALL of the I/O devices (Disk, Tape, Screen & Printer), Hi-Res Graphics, Sound, and Enhanced Screen displays, it is well suited for a wide range of programming applications. It generates a complete, Ready to Run machine language program. The finished product or program does not have to be interfaced to a Basic program to perform some of its functions or commands. This may seem obvious to you, but some of the other Color Basic compilers don't necessarily work this way. Some of their compiler commands need a separate Basic program in order for them to work. In some cases, require that a separate Basic program be interfaced to the compiled program to perform I/O functions, like INPUT, PRINT and so on. CBASIC doesn't do this. ALL of its commands are compiled into a single machine language program that does not require any kind of Basic program to make it work.

COMPATIBILITY

You may be wondering about those statements we made earlier concerning 99% or 99.9% syntax compatibility. What does that other 1% consist of? The biggest part of that 1% has to do with string arrays and variables. CBASIC does not use a "String Pool" like Color Basic. It uses absolute memory addresses to locate string variables and arrays. This is why CBASIC's string processing is so fast, it also eliminates the time consuming "Garbage Collection" problem. When CBASIC allocates space for strings, it must know how much space to use for each string. When you Dimension a string variable in CBASIC, you must tell it how much space you want to save for each element. To Dimension an array of 40 strings, 64 characters each, you would DIM DA$(40,64). If a string is not dimensioned, CBASIC will automatically allocate 32 bytes for it. If you want a single string to have enough room for 200 characters you would DIM AX$(200). For string arrays, you would still access the element you want, the same as Color Basic, to get string #30 from the array DA$, you would still use DA$(30), the only real change is in the DIM statement. For undeclared string arrays of 10 elements or less, CBASIC will automatically reserve space for 10 (0-9) strings of 32 characters. In some other Color Basic compilers, you have to declare EVERY string variable used in the progrm in a DIM statement. And, to create an array of 40 strings with 64 characters each, you would have to DIM AD$(2560), and then to access string #30, you would have to multiply 30 × 64 and use a special variable name format or access it one character at a time. Not very compatible or convenient to use, and difficult at best.

CBASIC REQUIREMENTS

CBASIC requires a minimum of 32K RAM and at least one Disk drive. We strongly recommend that you have 64K. CBASIC is compatible with all versions of Color & Extended Basic and both Disk Basic V1.0 and V1.1. Programs compiled on either system will run on systems with different ROMs. CBASIC is NOT compatible with JDOS.

DOCUMENTATION

The Documentation provided with any program is very important to the user. This is especially true when you talk about a program as complete and complex as CBASIC. Even though CBASIC was designed to be the most User Friendly compiler on the market, we went to great lengths to provide a manual that is not only easy to use and understand, but comprehensive and complete enough for even the most sophisticated user. The manual included with CBASIC consists of approximately 120 pages of real information, not like some manuals that put just one or two short paragraphs on a page. If we did it that way, we could have easily created a three or four hundred page manual. The manual index breaks down each section of the manual and gives a 3 or 4 word description of each section and its items along with page numbers. The manual has three sections, the Editor, Compiler and Appendix. Each of these is divided into subsections, with Section and Subsection titles printed at the top of each page. If you want to, you could find the information you are looking for by simply flipping through the pages and scanning the Section titles on the top of the pages. The Manual itself is an 8½ by 11 Spiral Bound book with durable leather textured covers. Some of the reports we have had from CBASIC users describe the manual as being the Best program manual they have ever used.

COMPARE THE DIFFERENCE

CBASIC is not just another Color Basic Compiler. It is the only complete Basic Compiler System for the Color Computer. Compare CBASIC's features to what other compilers offer and you'll see the difference. When comparing CBASIC to other compilers, you might want to keep some of these questions in mind. Does it support I/O functions? You can't write much of a program without PRINT, INPUT and so on. What about complex string statements, or string statements at all? How large of a program can you write? Can you compile a complex string like: MID$(RIGHT$(DA$(VAL(IN$),LEN(LE$)),3,3)? Can you use two character variable names for string & numeric variables, like Basic. Does it support all the Hi-Res graphics statements including PLAY, DRAW, GET and PUT, using the same syntax as Basic? Do you ever have to use a separate Basic program? Can you take complete Basic programs and compile them without extensive changes? Will they work? How do you edit a program when it has errors compiling?

PRICE VERSUS PERFORMANCE

The price of CBASIC is $149.00. It is the most expensive Color Basic Compiler on the market, and well worth the investment. We spent over 2 years writing and refining CBASIC, to make it the Best, most Compatible Color Basic compiler available. Most of our CBASIC users already bought one or more of the other compilers on the market and have since discarded them. We even traded in a few of them. If you want a cheap compiler, we'll sell you one of those traded in, at a good price. Before you buy a compiler, compare the performance of CBASIC against any Color Basic compiler. Dollar for Dollar, CBASIC gives you more than any other Color Basic compiler available.

ORDERING INFORMATION

To order CBASIC by mail, send check or money order in the amount of $149.00 plus $3.00 for shipping and handling to the address to the address listed below.

To order by VISA, MASTERCARD or COD, call us at: (702) 452-0632 (Monday thru Saturday, 8am to 5pm PST).

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The Computer Room

Improving the Breed And Walking the Dog

by Scott L. Norman



Telewriter has been fixed—not repaired, so much as augmented: The lack of a simple "block move" command has been attended to. When you shove phrases, sentences, and paragraphs around a rough draft as much as I do, that can be very important.

I have been using Howard Cohen's sturdy word processor, and praising it in print, since early 1982. For most of that time, I have also been bemoaning the fact that the program uses a complicated method to move things from one place to another within a given piece of writing. You have to mark the beginning and end of the desired text with clear/B and clear/E commands, move the cursor to the new location of the block, and issue a clear/C to copy it. Since this is a copy, rather than a true move operation, you have to go back and remark and erase the original text. The whole affair requires five commands (10 keystrokes), plus a lot of cursor motion.

Not any more. Bob van der Poel has written Telepatch, a knockout of an enhancement to disk-based Telewriter-64. In one shot this routine adds a straightforward move command, allows you to preprogram Telewriter with your favorite print formatting selections, and much more. It includes, and surpasses, Mick McGuire's improvements ("Improve Your Telewriter-64," *HOT CoCo*, April 1985, p. 40), and the green-text-screen fix I described in the July "Computer Room" (*HOT CoCo*, July 1985, pp. 18-19).

Telepatch replaces Telewriter's original Basic loader and disk I/O routines with new ones. By changing a series of POKEs and one DATA statement, you can set up your default print format, disk-drive stepping rate, and many other characteristics of your system. With just a little effort, anyone can end up with a personalized word processor. My own passion, the block-move command, is about as simple as it can be. Mark the beginning and end of the desired block just as you would for a copying operation, move the cursor to its new location, and press clear/T (for transfer), and zip! The material moves from its original location to the new one. The copy command is still available whenever you need it.

Just as this was going to print, Arthur Flexser made additional improvements to Telepatch. The latest edition gives you the option of having "*/***" instantly available in RAM at any time, instead of having to wait for it to be loaded from disk for every I/O operation. Even better, there is now a keyboard buffer, or type-ahead routine, that eliminates Telewriter's tendency to drop characters when you insert material into existing text. The text capacity drops to 20,793 characters, however, so you might want to make separate "big file" and "small file" versions of the program.

There's much more to Telepatch: automatic (and controllable) repeat on every key, an optional overstrike mode, I/O routines that remember the name of the last file accessed and thereby save you some typing, and so forth. These features only reduce the size of the text buffer by a measly 7 bytes. I don't think van der Poel is charging enough for the product. Buy it before he catches on.

Bob has informed me of a fix that Telepatch owners may want to make to the new disk-driver routine, "*/***." Check the line of code that gets you back to Basic from the Disk I/O menu; in my copy (version 2.1), it was line 580. If you find a piece that reads

. . .: CLEAR 200, &H7FFF: END

then delete the CLEAR statement and resave the routine. Otherwise, you'll wipe out the text buffer should you accidentally exit to Basic and try to reenter Telewriter with the usual EXEC 57110 command.

Just as this was going to print, Arthur Flexser made additional improvements to Telepatch. The latest edition gives you the option of having "*/***" instantly available in RAM at any time, instead of having to wait for it to be loaded from disk for every I/O operation. Even better, there is now a keyboard buffer, or type-ahead routine, that eliminates Telewriter's tendency to drop characters when you insert material into existing text. The text capacity drops to 20,793 characters, however, so you might want to make separate "big file" and "small file" versions of the program.

Good Stuff for Pro-Color-Filers

In my September column, I mentioned a couple of ways to add an auto-start feature to Dennis Derringer's Pro-Color-File (PCF). The objective was to have it start up and then load a particular data file without receiving any commands from me other than the initial RUN.

Auto-start can be handy when you constantly use an applications program with one particular data file, the way I use PCF with my manuscript database. In effect, the program remembers the commands that must be used to begin every working session and issues them to itself when appropriate. PCF, which requires a number of startup commands separated by prolonged periods of waiting for disk reads, is a natural target.

The auto-start process is often referred to as "walking the dog": letting the computer perform a vital but repetitive chore. The phrase was coined, I believe, by Macintosh owners unhappy with the time it takes the Mac to do anything.

Dennis Derringer has recently produced Simon, a utility that I'll be reviewing soon in *HOT CoCo*. For now, I'll just say that it's a little routine that can record sequences of command keystrokes for future playback. If those keystrokes happen to be responses to prompts from a Basic program such as the PCF loader, you have the basis of auto-start operation.

The easiest way to use the thing is to go through the chore you want to automate, with Simon "watching" from its niche in high RAM. You can assign a file name under which your inputs will be stored. Later, your files will appear on Simon's main menu, where any one of them can be invoked with a single keystroke. For example, one selection could take you all the way to the point at which you would specify an individual record to be updated.

Simon can record a total of 6,400 keystrokes in as many as 11 different command files. If you like, you can use several of them to auto-start PCF with different data files.

Simon can automate a lot of computer

drudgery, but there is another way to save some labor where PCF is concerned: a public-domain routine that automatically enters data-file names. You can find it in the March 1985 edition of the PCF National User's Group quarterly newsletter.

File Menu is their quasi-auto-start enhancement to PCF's ENTER/REC routine. I put in the "quasi" qualification because File Menu doesn't automate the task of designating what major function you want to perform when you enter PCF; however, it does eliminate the need to type in the name of your data file whenever you want to enter or view records. (Those happen to be my most common tasks when I'm working with my manuscript file.) If there is only one data file on the program disk in drive 0, PCF will continue as though you had typed in that file's name; if there are several data files, you will get to choose one from a menu just as you do with Simon. File Menu only works with recent versions of the data manager: "enhanced" version 2.0 and later.

It's a modest improvement, perhaps, but if File Menu interests you, I suggest you write to Group president Jorge Mir at the PCF-NUG address listed at the end of this column. Include $10 for a year's membership and ask him if he can start you with the March 1985 newsletter. I assume he will be happy to hear from you.

Regular PCF users should find plenty of worthwhile information in the bulletins: file and report templates for specific applications, quick-reference command tables, thoughts on using the program with 128K RAM upgrades, and lots more. A lot of interesting stuff is going on in the Group, including a move to broaden its coverage to include Telewriter and Dynacalc. Sounds like a good idea to me, especially since that will give us a chance to pick a new acronym. ■

Scott Norman is the manager of solid-state science at GTE Laboratories in Waltham, MA. Write to him at 8 Doris Road, Framingham, MA 01701.

Products Mentioned in The Computer Room

Telepatch
Canadian orders:
Bob van der Poel Software
17435 57 Avenue
Edmonton, Alberta T6M 1E1
403-481-1037
U.S. distributor:
Spectrum Projects
P.O. Box 21272
93-15 86th Drive
Woodhaven, NY 11421
718-441-2807
64K, disk
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Simon
Derringer Software
P.O. Box 5300
Florence, SC 29502
803-665-5676
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26-3017 64K Memory Kit	69.95	59.00
26-3008 Joysticks (PAIR)	19.95	16.95
26-3012 Deluxe Joystick (EACH)	29.95	25.00
26-1178 DCM-3 Direct Connect Modem	59.95	50.00
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Reviews

edited by J. Scot Finnie

Color Tape and Disk Managers 20
Super Sleuth 21
Game Writer 22
Uninterrupted Power Source 23
Hot Dog Stand 28

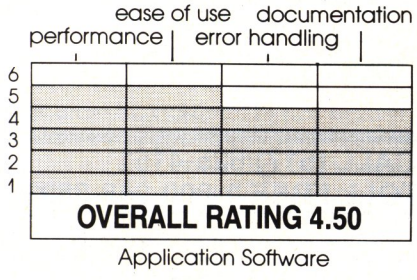
Review-Ratings Key

6	Unsurpassed
5	Excellent
4	Above Average
3	Acceptable
2	Needs Improvement
1	Unsatisfactory

Ed. note—The overall ratings that appear in the review-rating graphs are an average of the ratings for all the categories rounded to the nearest quarter of a rating point.

Interviewing Color Tape and Disk Managers

by Jeffrey S. Parker



Color Tape Manager (CTM) and Color Disk Manager (CDM) are from Sugar Software, 1710 N. 50th Ave., Hollywood, FL 33021, 305-981-1241. CTM requires 16K and Extended Color Basic. It comes on cassette for $19.95. CDM requires 32K and Disk Extended Color Basic. It comes on disk for $34.95.

Color Tape Manager (CTM) and Color Disk Manager (CDM) are file-utility programs. If the files on a given tape are jumbled up and out of order, you can use CTM to rearrange them. It is also possible to merge files with CTM, even Basic to machine-language files. In addition to these capabilities, CDM has several heavy-duty disk-maintenance routines for serious users who need to perform complex disk operations.

CTM is menu oriented and requires a good working knowledge of file handling and programming. If you want to insert a machine-language game into a larger Basic game, it can do that. If you want to write the routine as a Basic DATA statement, it can do that, too.

One group of features, which makes use of the utility's buffer space, is very powerful. It gives the user access to the memory registers, allowing you to examine memory bit by bit. The utility offers a display showing the decimal values, hex values, and ASCII character (if applicable) for any given spot in memory. This allows you to delete, copy, or modify the given memory register any way you choose. CTM also has a fast memory-scan feature; it displays all stop and start addresses from its own buffer. This gives users the choice of saving individual memory blocks, going directly to the memory addresses, or moving them at will within the program.

Although this cassette-based file-management program has a quiet profile, it is a powerful utility for users who know how to make the best use of it. The documentation is well conceived and easy to read. It includes several listings by way of example that show how to accomplish such things as merging machine-language programs with Basic.

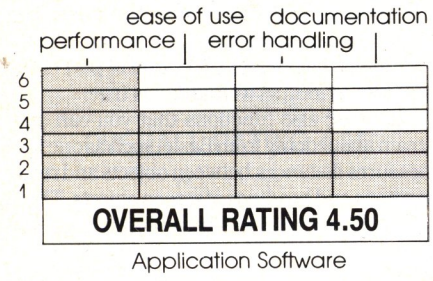
The disk-oriented version of CTM is also menu-oriented and easy to use. However, CDM goes a few steps further. It handles one to four disk drives and is 64K compatible for additional buffer space. It can perform track, sector, and granule reads on disks, generate an ASCII dump on screen, and transfer programs from cassette or ROM pack to disk. The utility can tell you everything you might want to know about a disk—and then change it all. It can generate allocation-table and file-granule maps. It also lets you make a backup of the disk directory that is out of Basic's reach so that no harm can be done to it. This is a valuable utility for those who need a debugging program and a diagnostic routine.

The most serious difficulty the user faces with either of these programs is knowing how to make use of their more esoteric functions. CDM is not for average users who are seeking merely to better organize their files. Unless you have a real need for such powerful features as the ability to examine memory registers, there is more to CDM than you are ever likely to use. The manual claims that displaying the memory contents of a program on screen and comparing it with that of other programs is a good way to learn. There is some truth to this, but users need to understand what they are seeing for it to be useful. This is something to keep in mind if you plan to use these programs only casually. For more advanced users, the extras are a definite plus.

Separately or together, CTM and CDM are powerful and full-featured utilities. If you have the need for the fine options these programs offer, for rescuing crashed disks, diagnostic work, or debugging purposes, they will be valuable tools. If you are learning to program now and will need their features in the future, you'll want to consider one or both of these utilities. Their ease of use and orderly manuals are excellent for less experienced programmers. And if you bring some technical knowledge with you, their attributes and uses will be more than just readily apparent, they will be deeply appreciated. ■

The Findings on Super Sleuth

by Bruce N. Warner



Super Sleuth for OS-9 is manufactured by Computer Systems Consultants, 1454 Latta Lane, Conyers, GA 30207, 404-483-1717. It requires 64K, OS-9, and one disk drive. A second disk drive and a printer are optional. The OS-9 version of Super Sleuth sells for $101. Add Georgia sales tax.

Learning a new disassembler requires time. You might have to make several hit-or-miss passes to complete a disassembly in search of a useful listing. Often a simple dump (similar to the OS-9 dump) could show you where all the text in a listing resides and where to start and stop disassemblies. But most disassemblers treat the entire file as executable code. This is not true of Super Sleuth. It multiplies its work to make yours easier. The product is really three separate programs in one: Sleuth, Chgnam, and Xref. And each of the three works as advertised or better.

No program is perfect, and Super Sleuth is no exception. Its weak point is its documentation, which might put you off in a few instances, such as, ". . .Before assembling the programs, refer to the 'Adapting to Your System' section for each program to determine what, if any, changes must be made for your particular configuration."

These changes are actually simple, however. Sleuth, the workhorse of this program, requires no more than four such changes. Three of these are located in the Cssleuth.txt file; they designate the level of OS-9, whether a Color Computer is in use, and whether Lloyd I/O's OSM assembler is in use. The fourth change concerns the screen width and is found in the Cssvarbl.txt file. With a good word processor you can locate and make the changes in minutes. The Chgnam routine does not need any changes. Xref requires only one change, the MAXNAM variable in the source file named Cssxref.txt. The only limitation to variable names is that, like OS-9 program names, they cannot exceed 31 bytes in length.

Sleuth

Most of the work you'll do with Super Sleuth uses the Sleuth routine. Unlike many disassemblers, this one is interactive. That means that you can work with the file while you are disassembling. The four most commonly used features of Sleuth do the following: disassemble a program in memory and write the source to a disk file; disassemble a program from a disk file and write the source to another disk file; dump the object code of a binary file in memory-dump format and allow modification to the file (the modified file can then be written back to disk); and dump object code from memory, allow modifications, and write the modified program to disk. These functions make Sleuth extremely flexible. With so many methods of looking at a program, it is easy to identify its bytes, whether they make up data, text instruction, variables, tables, or something else.

The program's utility extends in other directions, as well. Super Sleuth is not limited to disassembling OS-9 modules. It can also disassemble Flex 2 and Flex 9, 6800, 6801/3, 6802/8, 6805, 6809, and 6502 CPUs. There is also a separate 8080/5 and Z-80 version that runs in OS-9. These added CPUs require the user to get the module onto an OS-9 disk. This is a simple process for Flex files using O-Pak from Frank Hogg Labs; the other source files require a modem or a null-modem cable. With some additional cross checking and minor modifications, you can have other 68XX programs running in OS-9 with Super Sleuth.

The four commands available from Super Sleuth's command set control the use of address ranges, operations, modes, and miscellaneous commands. There are seven address-range commands that let you identify various blocks or bytes of the modules as FDB, FCC, FCB (assembler commands for putting ASCII text on screen or in memory), Instruction, Instruction and ASCII, Ignore, and RMB (reserves bytes for expressions) ranges. When viewing large blocks of data, it is easy to identify blocks of code because each byte's ASCII character is also displayed when using the dump-to-screen program.

The operation-commands part of the Sleuth routine generates output. The command set lets you disassemble a program; display, examine, and change its code; fill code with a specific byte; view code within a disassembly limit established previously; write a binary file to disk; and find a hex string in program code. Operation commands also let you execute OS-9 commands or abort Super Sleuth and return to the operating system.

The mode commands allow you to change the cross-assembler switch, the separate-label switch, and the 6809 position-independent switch. They also let you set Super Sleuth to disassemble with one of the CPUs listed above. The miscellaneous commands let you change parameters, including input file, output file, disassembly range, and a number of other options.

On its own, the Sleuth portion of the program is well worth the cost of the entire package. It provides the opportunity to view an entire file and mark specific sections according to their purposes in the program, change portions of the file before and during disassembly, disassemble in part or in whole, save the file to disk, and dump the listing to a printer.

Chgnam and Xref

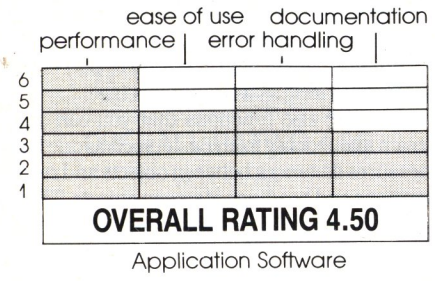
Sleuth's output produces labels that are assigned a letter and number based on the location of the label. You might want to substitute "START" for "x0000" and "PRINT" for "y1023." The Chgnam utility is provided for just that sort of procedure. To make a change, you enter a series of Sleuth labels and the new labels that you would like to use in their place. Chgnam does the work of replacing every occurrence of the labels. If you would like a table of the labels in a program, the line number that defines a label, and all references to that label, Xref can perform this chore for you. It can also provide a sorted list of labels.

The Upshot

Super Sleuth is a powerful disassembler that lives up to all its claims. It also makes modifications to any program simple. Its only shortcoming is its documentation, although this will not be too big a problem for advanced users. One improvement to the documentation would be to place the "Adapting to Your System" section at the beginning of each chapter to which it pertains instead of burying it near the end. But this is a minor point. The upshot is that Super Sleuth for OS-9 is a well-written, error-free program that provides the serious program modifier with a highly useful tool. ■

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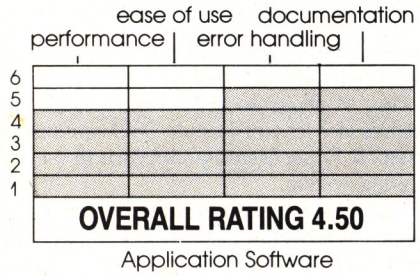
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A Turn at Game Writer

by Richard Ramella



Game Writer is manufactured by Tandy Corp. (catalog no. 26–2572), 1400 One Tandy Center, Fort Worth, TX 76102. The program requires 32K, Extended Color Basic, and a disk drive. It sells for $44.95.

Game Writer is a computer language for creating games that offer possibilities of complex human interaction and have good speed, sound, and color. Because the program focuses on the requirements of good computer gaming, the listings it produces tend to be shorter than Basic listings of similar programs.

Game Writer is not a game-writing panacea that can produce arcade-action games for the neophyte with a few button taps. It is its own disk-based language that is no more difficult to learn than intermediate-level Extended Color Basic. If you are experienced with another computer language, its concepts will not be foreign to you. It is important to keep in mind that you cannot use Game Writer to turn out commercial software. Listings produced by Game Writer only run when the language is loaded in the computer along with them.

Program author Larry Kheriaty is also coauthor of the Color Logo and Super Logo languages from Tandy. It seems as though he drew up a wish list of capabilities he wanted to see in a game-programming language and then created Game Writer. The language contains loud echoes of other programming systems, including Logo turtles and movement, the Apple shape table, and Commodore-style sprites.

I started by loading Game Writer and trying the 10 examples on the package's separate game disk, which range from instructive to dazzling. I especially like the simulation that depicts orbiting planets with the moon describing its own orbit around the earth. That would be a difficult feat in Basic. Another graphics show features an endless series of little men trampolining across the screen. And there is a shooting gallery game featuring space ships.

The Game Plan

Seeing the program examples will make you curious about how they are accomplished. Game Writer has three modes: control, edit, and run. The control mode displays an OK prompt, which waits for you to type E to edit, R to run, or other commands that erase program memory, print to paper, and save and load to and from cassette or disk.

When you press E, Game Writer summons the current program listing. The editing procedures are similar to those of Color Logo, which are simple but effective. There are just a few cursor commands that do all that is needed.

I found that the listing for the Solar System model I admire was all but incomprehensible. But then, it isn't Basic. The only recourse is to read Game Writer's 76-page manual, which comes in a three-ring binder. The documentation is very well done. It walks the reader through concepts that mesh and remesh at every turn. Here are some of the highlights of the program you glean right away by reading the manual:

- Movement is achieved by giving a screen object a heading, which can be at angles of 0 to 359 degrees. As in Logo, there are heading, move, and turn commands such as forward, back, right, and left.
- The position of screen objects is based on Cartesian x,y coordinates ranging from 0 to 255 left to right and 0 to 191 bottom to top, which is different from Extended Color Basic.
- An edge value determines where a moving object will sense an edge and how it will react to one, such as screen wrap, disappear, or bounce.
- Shapes of 16-by-16 high-resolution pixels can be made easily as a program procedure. Just put an X where you want a dark area and a period for a light area. When compacted, these shapes have a nice appearance. Multiple shapes can be printed in the same place for animation effects. Shapes can also have different colors.
- Two different sets of four colors can be displayed.
- There is a draw command for creating patterns or pictures.
- Various sounds are achieved using duration numbers and 26 letters for tones.

Game Writer's action can be slowed. And as in Basic, there are text-printing and variable-setting functions, IF . . . ELSE statements, and versions of INKEY$, ABS, and RND. Unlike Extended Color Basic, there is a WHILE statement that causes execution of part of the program as long as a situation is true.

There are also functions that you can only dream about doing from Basic, such as one that measures distances between objects and reads positions and headings of screen objects. There is a mail statement in which objects are given ID values so they can send messages between one another. This feature could be used for producing interactive effects.

If you put all these functions (and others) together, you will have a screen full of objects. They could bounce, explode, communicate, evade, keep score, make noise, disappear, circulate, and just about anything else a game programmer might desire. Game Writer is a good game-writing language. Despite similarities to Logo, it is much more than a glorified turtle program. With knowledge of Basic and Logo as a start and the example listings to guide the way, I created moving shapes and still pictures in my first attempts with Game Writer. And Game Writer is not just for fun and games. It can simulate the physical world for experimental situations. It might benefit students, not just as a learning experience in programming, but as a means of creating physics models.

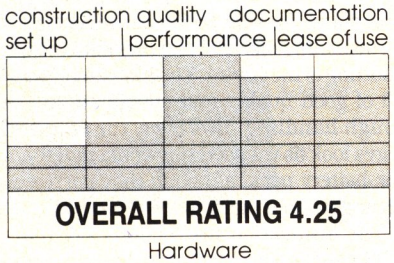
The Score

There is one notable drawback to this program. As already mentioned, the Game Writer disk is required not only for writing a program but also for running it. Although you can save a program to disk or cassette and print its listing on paper, you can't share it with others unless they also have the language disk. So unless Game Writer is a wild success that endears itself to a large user base, it is unlikely to be more than a curiosity. Making use of Game Writer means that you are isolating your game-programming world.

A solution to this problem might be to market an inexpensive Game Writer package designed solely for running listings that have been written with the language. This would encourage programmers to create game software with Game Writer and spread it around. If Game Writer becomes popular, a natural result might be the formation of a subculture within the Color Computer world, which would include users' groups, newsletters, and maybe even books and magazines. Otherwise, the only person apt to be playing your Game Writer games is you. ■

Uninterrupted Power Source

by Gary W. Clemens



Hardware

Uninterrupted Power Source (UPS) is manufactured by Dynamic Electronics Inc., P.O. Box 896, Hartselle, AL 35640, 205-773-2758. It is designed to work with any Color Computer and sells for $59.95, plus $2 for shipping.

Has Dynamic Electronics pulled the plug on the Color Computer? Well, not likely. But their new product, Uninterrupted Power Source, lets you do just that. The UPS is a backup power supply designed to provide power to the memory chips in case of power failure, preventing loss of programs or data in memory if the lights go out. The device consists of a rechargeable battery, an electronic control circuit, an LED (light-emitting diode), and a small toggle switch. The unit is designed to fit under the CoCo's keyboard. It can also be connected externally.

Set Up

Installation of the UPS is accomplished by removing the top of the Color Computer, installing the battery pack under the keyboard, attaching three wires to various components on the circuit board, and drilling two holes in the computer's case. It also involves soldering one wire to a diode, resistor, or capacitor depending on your particular board. This is not difficult, but you should take some precautions, such as unplugging the computer, using fine solder, and selecting a low-wattage soldering iron.

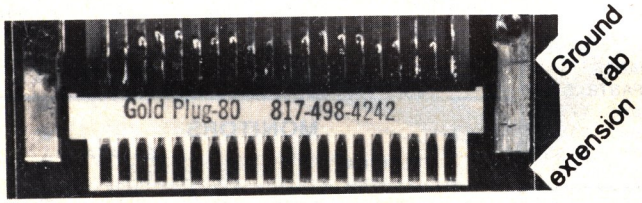
Two other wires must be connected to either a RAM or ROM chip. Dynamic Electronics has made these connections solderless by providing tiny loops on the wire ends. To connect these two wires, you remove the chip with an IC (integrated-circuit) puller or small flat-blade screwdriver, slide the loops over the correct pins, and replace the chip in the socket. The only other installation steps required are drilling holes for the LED and the toggle switch. I mounted these on the front of the bottom section of the case. I put the LED just below the joint between the upper and lower halves and the switch beneath the protruding lip, where it cannot accidentally be bumped to the off position.

I encountered a problem with the installation concerning the size of the battery pack. It is too big! It is intended to fit under the keyboard, and even has double-stick foam tape to keep it stationary. Believe me, the tape is not necessary. When I put the case back together, I discovered that the battery pack is about an eighth of an inch too high. I

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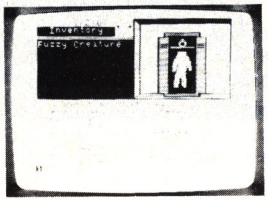
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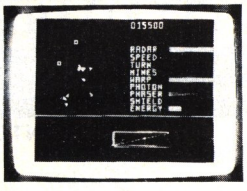
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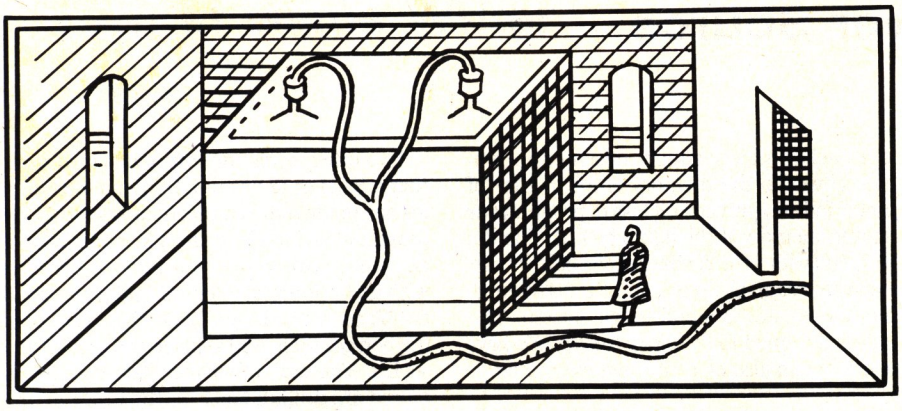


Illustration by Maris Bishofs

had to scrape the foam tape off and force the two halves together, which bent the top half slightly. And I had the same problem with both the original CoCo and the CoCo 2. If you have a replacement keyboard, the battery pack might not fit under the keyboard. If you don't have 1⅜ inches of clearance between the bottom of your keyboard and the lower half of your CoCo's case, you'll have to mount the battery pack on the outside of the computer.

As many readers are aware, there are three versions of the CoCo 2. The installation procedure covered in the instructions that I received applies only to grey-colored CoCos and the first version of the CoCo 2 (made in the U.S.). The two Korean versions have different component layouts, so you will have to contact Dynamic Electronics for updated instructions. You can tell which version you have by looking at the position of the RAM chips. If all eight chips are in one row, you have the original CoCo 2 for which Dynamic's instructions were written. If the RAM chips are split into a row of three and a row of five, you have the first Korean version. If your computer has just two RAM chips, you have the second Korean version.

Construction Quality

The battery pack is a sealed, heavy plastic unit that looks indestructable. It has a small circuit board attached solidly to its side and two wires connected to terminals. Both the circuit board and the wire terminals are coated with an insulating material that prevents accidental shorting of the circuit. The individual parts are all of good quality and should survive even rough handling. However, the connection wires look as if a good tug would pull them off the battery pack, although they survived my testing without incident.

The installation instructions say that the UPS can be mounted outside the computer case, but I don't recommend it unless you add some parts. If you decide to make an external hookup, you should mount the battery, switch, and LED in a project box and run heavier wires to the computer by using a DIN plug, which will make one neat connection. If you don't set up something like this, you will eventually break off wires from the battery pack.

Documentation

The instructions consist of two typed pages that cover installation procedures for

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the D, E, F, and original CoCo 2 boards. They also offer suggestions for installing the UPS in other computers. In addition to providing thorough step-by-step directions for installing the UPS in each board version, the brief manual also covers operation of the unit and charging of the battery. The only awkward instruction I found was in the section covering CoCo 2 installation, which tells you to solder a wire "to the top" of CR3. Because CR3 is a bakelite-encased diode, soldering should be made to one of the capacitor's leads, which are on its bottom. A quick check with my multitester indicated that you should solder the wire to the lead on the diode that is closest to the rear of the computer.

Outside of this error, the UPS's instructions tell you explicitly which wire goes to what lead or pin of each component. The directions also include one of the best explanations that I have seen for determining which pin is which on the RAM and ROM chips to which you connect the other wires. All hardware documentation should be this thorough.

Ease of Use

Using the UPS entails little more than flipping a toggle switch from one position to another. One position enables the backup power mode and the other disables it. The only time you might encounter a problem is if you leave the battery turned on too long with the computer turned off. If this happens, it will take several hours to recharge the battery (with the computer turned on).

Performance

Few products actually offer more uses than they advertise; the UPS happens to be one of them. It not only keeps your memory chips "alive" but also keeps most of the rest of the computer working. If you have a battery-powered TV set and cassette recorder, you can continue running programs and save them to cassette during a power outage. For some reason, a battery-powered cassette player will not load programs.

The biggest unadvertised bonus to installing the UPS comes into effect during occasional low-voltage periods, which occur in many areas of the country. The UPS handles a low-voltage condition well because it can add power in operation with any line voltage from zero to 120 or more. I checked this out by running a program that PEEKed and POKEed values to memory and then read them back to the screen while I reduced the line voltage at a steady rate with a variable power supply. The UPS added power flawlessly, that is, without any data dropouts. When I ran the same test with the battery-backup device turned off, the CoCo crashed by the time the voltage had dropped 30 percent.

The documentation says that you will have one to two hours of protection with the battery pack fully charged. It also maintains that UPS will provide protection for short durations even if the battery is almost discharged. I was not able to determine how long it takes to fully charge the battery, but I charged it for about three hours and then ran the PEEK and POKE program mentioned above. It ran for an hour and five minutes before the battery gave out.

Conclusion

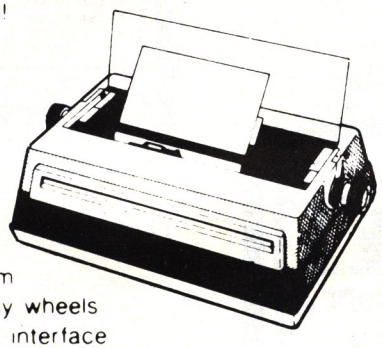
The Uninterrupted Power Supply is a useful accessory to add to your Color Computer. It could prevent the loss of valuable data in the event of low-voltage conditions or power outages. Despite some problems with installation, the UPS is a dependable battery-backup system. You could be sorry if you don't look into this one or one like it. ■

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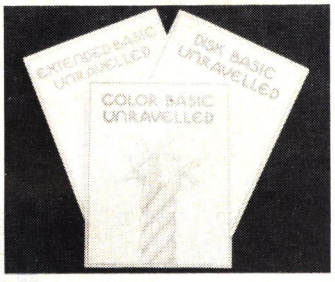
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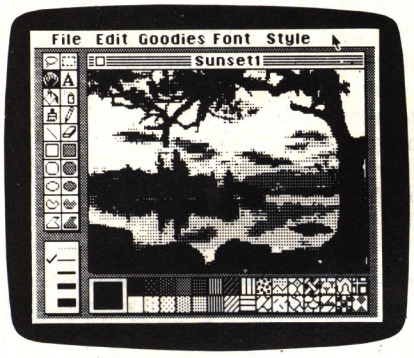
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CoCo Max

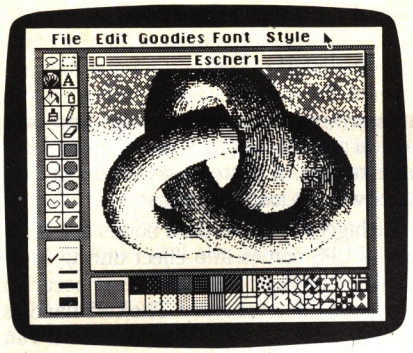
This is one of those rare programs that will captivate everyone in your family.... No one can see CoCo Max and not want to try it!



We are all witnessing an exciting revolution in microcomputers: a radically new kind of computer and software that opens a whole new world of creative power to computer users.

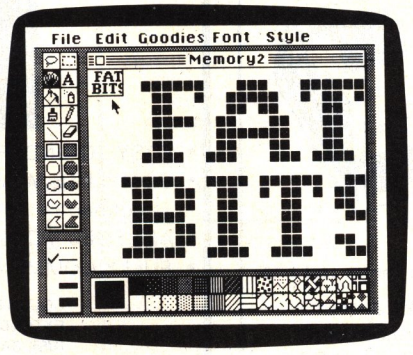
It was inevitable that this exciting approach would be brought to the CoCo. With this in mind, Colorware chose to go all out and maximize this new concept for the color computer. That meant designing not just software but hardware too. It meant thousands of hours of pure machine language programming. Rarely has this much effort been applied to one product for the Color Computer.





UNMATCHED CAPABILITY...

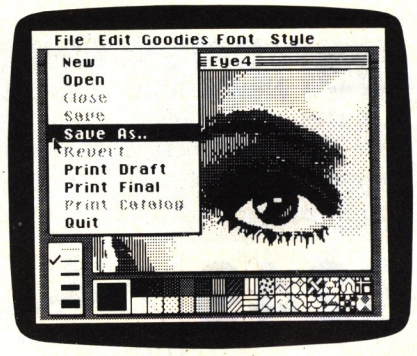
Because we took the maximum approach: highly optimized machine code combined with hardware, CoCo Max truly stands above the rest as the ultimate creative tool for the Color Computer. It's unrivaled performance lets you create with more brilliance and more speed than any similar system – much more than you ever imagined possible. And, you can do it in black & white or color.



All the sophisticated power of the bigger systems is there: ***Icons, Pull-Down Menus,*** full ***Graphic Editing, Font Styles,*** and all kinds of handy tools and shortcuts.

Plug your joystick, mouse or touch pad into CoCo Max's Hi-Res Input Unit. Then use a delightfully simple ***Point-and-Click*** method to get any of CoCo Max's powerful graphic tools. It has them all:

You can ***Brush, Spray*** or ***Fill*** with any ***Color, Shading*** or ***Pattern.*** Use ***Rubber Band Lines*** and ***Shapes*** (square, rectangle, circle, elipse, etc.) to create perfect illustriations with speed and ease. There's a ***Pencil,*** an ***Eraser*** and even a selection of ***Caligraphy Brushes.*** And, as you can see, CoCo Max can do a lot with text.
All of the newest special effects are there: ***Trace Edges, Flip, Invert, Brush Mirrors,*** etc. And all of the very latest supercapabilities like: ***Undo,*** which automatically reverses your mistakes, and ***Fat Bits*** which zooms you way in on any part of your subject to allow dot-for-dot precision.



THE BIG PICTURE

The large image box in the middle of the CoCo Max screen is actually only a window on an even larger image. Use the Point-and Click "Hand" to effortlessly move your window over any portion of the larger image. You have a working area of up to 3-½ times the area of the window itself.

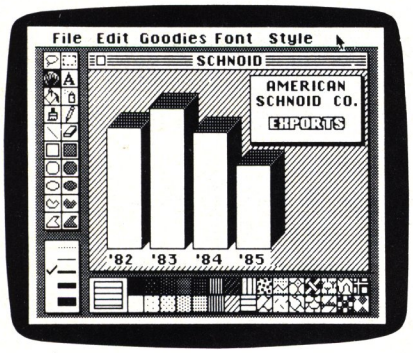
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CoCo Max gives you many ways to print. Fill a whole page with your image or condense two full CoCo screens to less than ¼ page for a finely detailed copy. "Dump" your CoCo Max screen full size or shrink it to ⅛ page size.

THE COCO MAX SYSTEM

FREEDOM TO CREATE...

Anyone who wants to create anything at all on their CoCo screen or printer will certainly be very glad to meet CoCo Max. CoCo Max's friendly yet sophisticated graphic and text capabilities let you almost instantly produce illustrations, diagrams, charts,



graphs, and computer art – for serious use or just for creative fun.



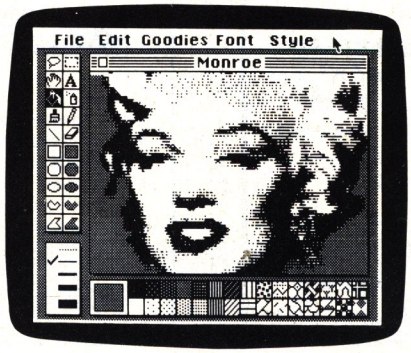
tion by using software schemes such as sliding windows. Although clever, these schemes yield sluggish and awkward results. Only CoCo Max does it the right way. The CoCo Max Hi-Res Input Unit plugs into your ROM slot and adds an entirely new joystick input to your computer – a precision one with a 49,152 point resolution to match the CoCo screen exactly.

Plug your same joystick, mouse or touch pad into this new input and you have a whole new kind of control. The difference is remarkable.

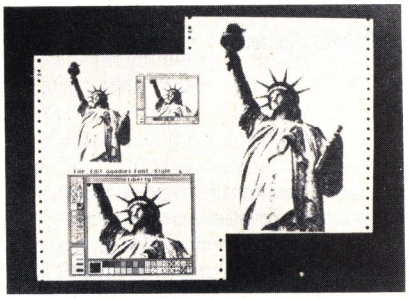


A DIGITIZER OPTION...

We studied all the video digitizers available and picked the best of them to link with CoCo Max. The DS-69 from Micro Works was our choice. This optional device lets you capture the image from any video source (video recorder, camera, etc.) on your Color Computer.



You may then use CoCo Max's graphic magic on it. The DS-69 is available as an option from Colorware from $149.95 complete with its own software on disk or tape. Using the DS-69 with a disk requires an RS multi-pak adaptor.



COCO MAX REQUIREMENTS

The CoCo Max System includes the Hi-Res Input Unit, software on disk or cassette (please specify) and user manual. It will work on any 64K Extended or non-extended Color Computer. You'll need a Radio Shack or equivalent joystick, mouse or touch pad. Disk systems require a Multi-Slot Interface or Y-Branching Cable.

THE COMPLETE COCO MAX SYSTEM, with software on ***DISK***.....***$69.95***

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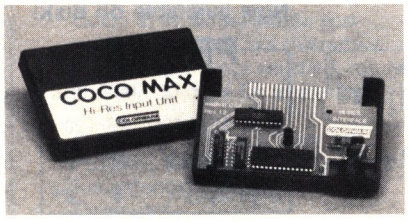
COLORWARE

AN ABSOLUTE GUARANTEE

CoCo Max is a hardware software system that no software-only system can match. Get CoCo Max and see your CoCo perform as it never could before. If you don't agree that CoCo Max is the ultimate creative tool for the Color Computer, simply return it within 20 days for a full, courteous refund from Colorware.

THE HARDWARE...

This is the key to CoCo Max's unmatched performance. Did you know the normal joystick input built into the Color Computer only allows access to 4,096 (64 x 64) points on the CoCo screen? Yet, the Color Computer's high resolution screen



has 49,152 (256 x 192) pixels. This means that a joystick, mouse or even a touch pad can, at best, only access about one tenth of the pixels on the CoCo screen.

Most graphic programs ignore this hardware limitation of the Color Computer and give you only low-res control. Others attempt to overcome the limita-

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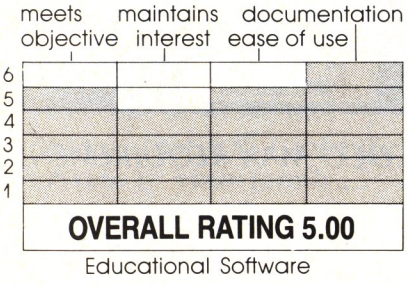
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Hot Dog Stand Passes Mustard

by Richard Ramella



Survival Math Skills: Hot Dog Stand is produced by Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570, 800-431-6616 (home market), 800-431-1934 (school market). The program requires 32K and a disk drive. It sells for $59.

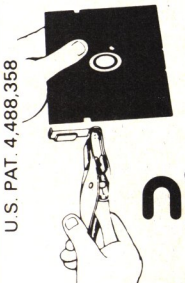
Some high-school programs allow young entrepreneurs to taste the business world in a realistic way. Junior Achievement is one example, a program in which students conduct all the facets of a manufacturing, retail, or service industry, trying to make a profit.

Sunburst's Hot Dog Stand, written by Walter Koetke and converted to the Color Computer by Steve Abrams, is a simulation of such an experience. The introduction states that your school club is going to run a hot dog stand at eight football games. You start with $200 in your treasury. Your goal is to make $2,300 by the end of the season.

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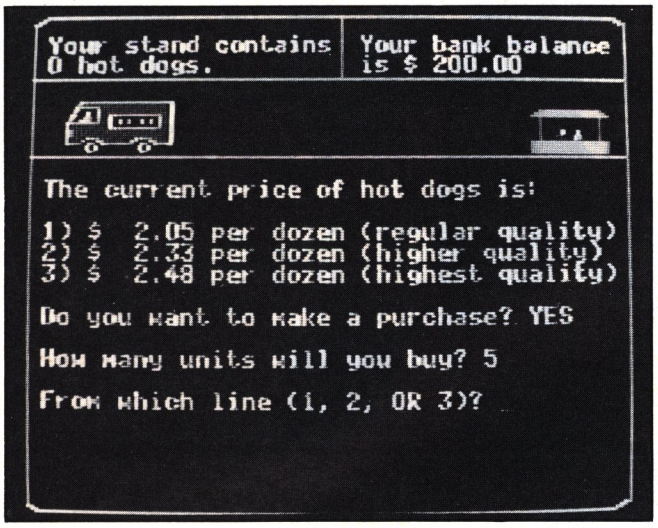
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A Screen from Hot Dog Stand by Sunburst Communications

Hot Dog Stand is well programmed. I liked the little trucks that back up to the hot dog stand to offload goods. I also liked the contemplative outlook players assume as a result of the string of decisions they face. My opinion is shared by some young testers, prospective yuppies all, who saw profit at the game as a life-or-death experience equal to saving the galaxy.

What I didn't like is the fact that the premise behind Hot Dog Stand has become a computer software cliche, though I have never seen it done better. For example, the Apple //c comes with a program called Lemonade Stand that is the same thing. The precursor of such programs seems to be Hammurabi, an old (in computer terms) all-text Basic program about a ruler who must balance work, expenditures, and numbers of crops against population needs. However, this won't matter to anyone new to the genre. The fact is, this kind of program is quite high in user involvement.

In several trials, I went broke trying to sell sodas for $3 each, basely presuming that the scalding weather would squeeze my price from the angry mob surrounding the stand. A 12-year-old girl amassed $500 in the first three games and departed, announcing that she was absconding with the club's cash to buy heavy-metal cassette tapes. A 9-year-old boy became deeply involved in the game, playing it several times to the end.

Hot Dog Stand has an underlying strategy that can be learned in repeated plays, but randomness intervenes, producing different results with each play. This puts the program a notch or five up on others I've seen in the genre. And while several of us huddled around the screen, arguing about prices and units, I realized that we were functioning as business partners: bickering, triumphing, and holding each other responsible for mistakes. Just like life!

As the complete instruction manual notes, these skills involve the four fundamental math operations, estimation, money management, and planning. It might even create a few entrepreneurs.

Hot Dog Stand could be a staple in any school's program collection, and it has great merit as a home game. Pass the mustard. I'm going to eat a couple of these frankfurters before the game starts.■

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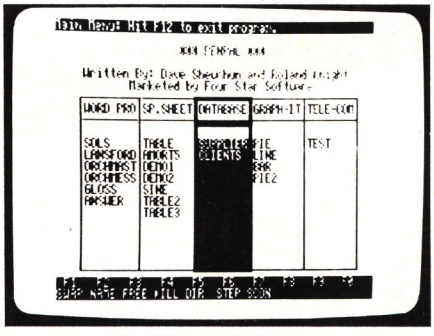
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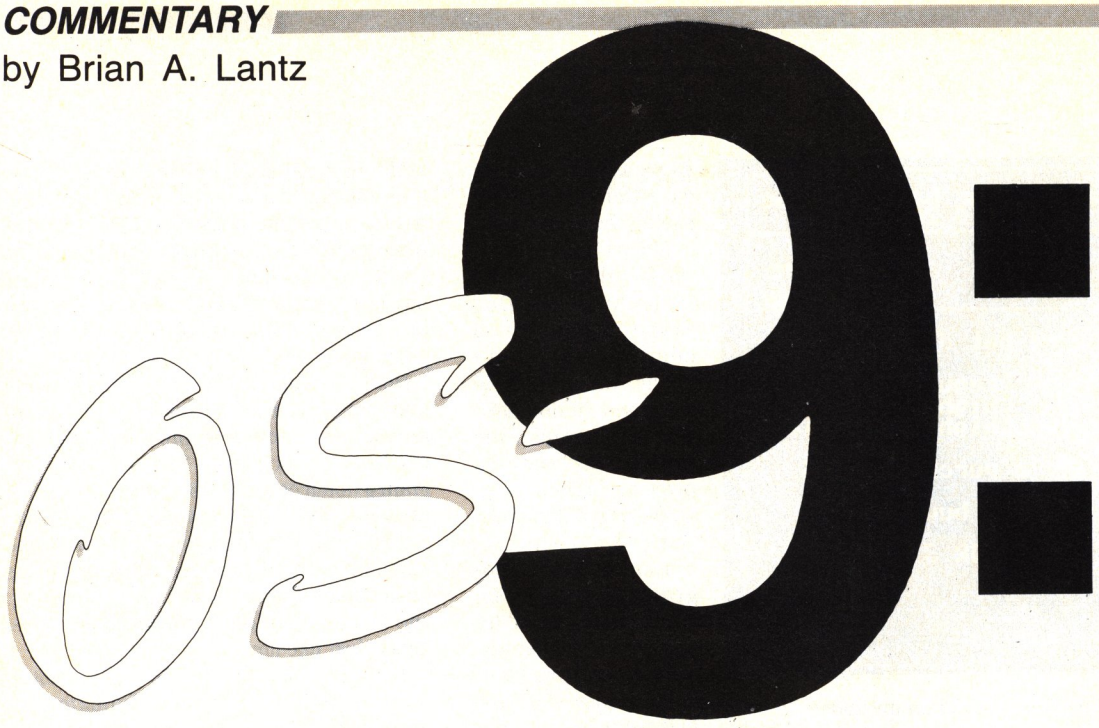
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COMMENTARY

by Brian A. Lantz



Fact and Fiction

The plain truth about the CoCo's up-and-coming operating system

Lately there has been a lot of talk about OS-9. Most of it has been confusing and has taken for granted that everyone is already familiar with it. As a result, many CoCo owners are greeting with apprehension Tandy's decision to implement OS-9 on future CoCos. I'd like to clear the air by providing honest answers to the most frequently asked OS-9 questions.

What Is OS-9?

OS-9 is an an advanced multitasking, multiuser operating system. It has many features of the popular Unix operating system, as well as a number of improvements, but is smaller and more efficient than Unix.

Multitasking allows the computer to work on more than one program (task) at a time. Print spooling is a simple form of multitasking. If, for example, you want to spool your printout in OS-9, you simply add an ampersand (&) at the end of the command line. This tells the operating system to perform the command in the background, letting you retain control of the computer for other tasks.

A multiuser system permits simultaneous use of the computer by two or more people. Unfortunately, hardware on the CoCo does not allow you to take full advantage of this capability. With an RS-232 "bit-banger" port, however, a second user can access the CoCo under OS-9, using an external terminal or another computer.

Isn't Disk Extended Color Basic An Operating System?

Even though most common features of an operating system are built into Disk Extended Color Basic, it cannot be considered an operating system. A true operating system is in total charge of the environment of the computer; that is, the operating system initiates all actions taken by the computer. What is more, an operating system allows programs written in different languages to use the entire capabilities of the computer.

New versions of an operating system should not make obsolete software developed for earlier versions of the operating system. An operating system also makes it easy for programmers to use the computer's features by providing system calls or I/O (input, output) vectors.

As many CoCo users know, Disk Extended Color Basic has a history of making software obsolete each time a new ROM (read-only memory) comes out. This is because there are no system calls, I/O vectors, or methods for using the routines in ROM without bypassing Disk Extended Color Basic and calling undocumented ROM calls.

What Makes OS-9 Different from Other Operating Systems?

Next to the multitasking capability mentioned earlier, the biggest difference is that OS-9 has what is called "device-independence." Anything that you can put on your screen (including an OS-9 program), you can easily transfer to the printer or other device. To accomplish this, tell the shell—the command interpreter that accepts commands from you and directs the operating system to carry out your wishes—where you want to send the output. Device-independence is supported for input as well as output, so you can get program input from a file or another program as easily as you can redirect output.

Another difference is that OS-9 is a modular operating system. A module is a small section that deals with a specific problem. There are, for example, modules called device drivers that handle the screen/keyboard I/O (called CCIO), the disk (CCDisk), the printer (Printer), the bit-banger RS-232 port (RS232), and the RS-232 ACIA (asynchronous-communication interface adapter) card (ACIAPak). To add a new device, you need only add a new device driver. Therefore, if you wanted to use PBJ's Word-Pak on OS-9, you would add a device driver called Word-Pak to your version of the operating system and remove the the CCIO. You do this once and never have to worry about it again!

Finally, OS-9 lets you create subdirectories on a disk so that you can group related programs and data files. On RS DOS, all files are located in the main directory. If you have numerous files, you will have to swim through them each time you view the directory.

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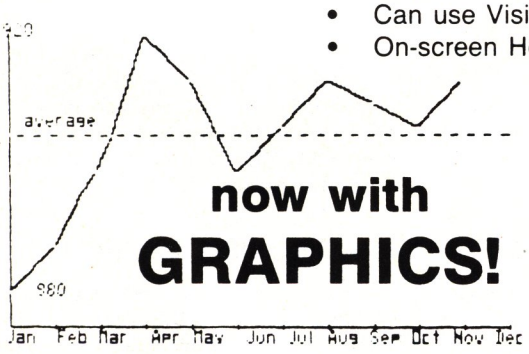
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Did Tandy Develop OS-9?

Microware Systems Corp. created OS-9 many years before Tandy licensed it. Development began in 1978 when Motorola licensed Microware to design a state-of-the-art language for their new 6809 microprocessor. As they began work on the language, Basic-09, Microware realized that they would need an operating system, since no existing operating system offered the features they needed.

Today, OS-9 is well known in the industrial community, where it is used in factories to run small dedicated systems. Companies such as Kodak, Mitsubushi, Fujitsu, Motorola, Thompson, Tandy, AT&T Technolgies, and NASA use OS-9 on a day-to-day basis. I am also told that Herbie Hancock has a synthesizer run on OS-9 and that the Rolls Royce quality-assurance department has an OS-9 based computer system. OS-9's biggest following is overseas. It is commonly used in England, Germany, and Sweden; in Japan, it is the most popular operating system.

Why Has Tandy Chosen to Use And Support OS-9?

Tandy recognizes the power and flexibility of OS-9. With it, they can develop a family of computers that uses different hardware but the same software; they could even develop 68000 computers that have disk compatibility with the CoCo. In fact, Tandy has so much faith in the OS-9/CoCo combination they have announced that the only way third-party software manufacturers can guarantee future compatibility with the CoCo is to write programs in OS-9. And it is rumored that new members of the CoCo family will have OS-9 in ROM and will not even offer Microsoft Basic as an option.

What Can I Do in OS-9 that I Can't Do in RS DOS?

You can run programs that are longer than 64K in OS-9 Pascal. Tandy's OS-9 Pascal allows two compilation methods. You can compile straight down to Assembly code or to an interpreted code called i-code; the regular or the swapping interpreter can run the i-code. The swapping interpreter keeps only as much of the program in memory as it is able. Since the remainder is read in from disk as needed by the swapping interpeter, program length is not restricted. OS-9 offers file security, too. You can write- and read-protect files from the user or the public.

Is OS-9 as Complicated as I've Heard It Is?

With power and features comes confusion. The biggest problem seems to be that computerists try to use the advanced features of OS-9 without reading the explanation of those features in the manuals. Let's face it, OS-9 is not an operating environment for "the rest of us." However, it gives you features only dreamed of years ago. And you can understand and use most of these features minutes after installing OS-9 on your CoCo. The more advanced features are, of course, more difficult to understand and probably will not be needed by most users.

Should I Buy OS-9?

Tandy is just beginning to release software for OS-9. One such program, OS-9 Profile (which I developed), was previously marketed by Computerware as OS-9 Databank Manager. But even with the new releases, Radio Shack stores are not offering a great deal of OS-9 software. Fortunately, there are other sources, including Computerware, Frank Hogg Labs, and D.P. Johnson; other developers are jumping on the OS-9 bandwagon, too. If you are reluctant to order by mail, consult the Express-Order Catalog in Radio Shack Computer Centers—new OS-9 products are being added all the time.

If you've been wondering whether to purchase OS-9 for your business, programming, educational, or household needs, the answer is yes. The CoCo and OS-9 can be the two best business investments you will ever make. There are professional software packages to handle most business applications. For programmers, OS-9 offers one of the best (if not the best) programming environments available. The variety of system calls makes I/O and system functions easy to peform.

As an educational tool, OS-9 is unsurpassed. If you read computer magazines or even the daily newspaper, you've probably read that Unix is in use everywhere. Colleges and universities in increasing numbers are teaching the Unix system. This is good news for OS-9 users because anyone familiar with OS-9 will be able to use a Unix system almost immediately. In fact, the C compiler for OS-9 is so similar to the one used on Unix that most C programs written on OS-9 will run on a Unix system without changes.

In the home, the applications for OS-9 and Basic-09 are limited only by your imagination. Basic-09 is so easy to use that it will encourage you to use your computer in ways you hadn't considered when you used Microsoft Basic.

How Do Basic-09 and Microsoft Basic Differ?

First, the regular and advanced features of OS-9 are available from within Basic-09; that alone gives Basic-09 a powerful edge over Microsoft Basic. Furthermore, Microsoft Basic is an interpreted language, which means it must execute lines one at a time. Basic-09, on the other hand, is partially interpreted; it automatically compiles the line into a code that is easier to manage and quicker to execute. To increase speed further, you can pack debugged Basic-09 code.

Basic-09 allows users more freedom. You can write programs using line numbers as you always have, or you can omit line numbers and make a separate program for each task. Basic-09 also accepts longer variable names. Such changes make programs easier to read, but that's not all. Basic-09 indents each FOR. . .NEXT and IF. . .ELSE section, making program logic easy to follow and programs easy to debug.

Speaking of debugging, Basic-09 makes a potentially painful process more civilized. When you enter a line in the edit mode, it is automatically checked for syntax errors; you know immediately if there is an bug. And when you exit the edit mode, Basic-09 checks the program for other errors (e.g., FOR without NEXT). If there are still bugs, Basic-09's debug mode can help you find them.

When Microsoft Basic adds a general-purpose editor, a complete debugger, entry-time checking, interpretive or compiled modes, and complete control of the environment, it will approximate the power of Basic-09. But the ease with which you can learn Basic-09 will be hard to beat.

Are There Other Languages Available for OS-9?

Other Basics available include Random Basic, a Computerware program that has been running businesses for years, and KC Basic, a small Basic created by Steve Odneal of P.R.O. Systems. Frank Hogg Labs sells Dynasoft Pascal, one of several Pascals for OS-9. But the most popular language is probably the C Compiler from Tandy. Programmers like C because of its flexibility, and since OS-9 C is almost identical to Unix C, it is an excellent choice for someone who works with Unix at work or school. Microware markets a full-featured Cobol compiler; even with limited disk space and the standard 32-by-16 screen, it is worthwhile. Finally, a full Fortran compiler will soon be released for OS-9.

How Does OS-9 Add Up?

OS-9 requires that new users learn another operating system, but the time is well spent. You won't find a better business or educational environment for the CoCo or any other computer. The $70 investment is a small price to pay for an operating system found only on minicomputers and mainframes a few years ago.

Who says the CoCo is only a game computer?■

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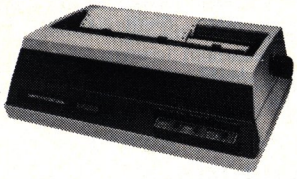
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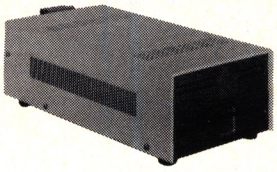
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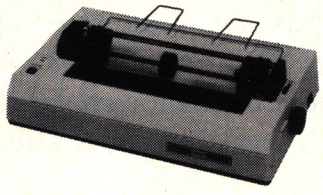
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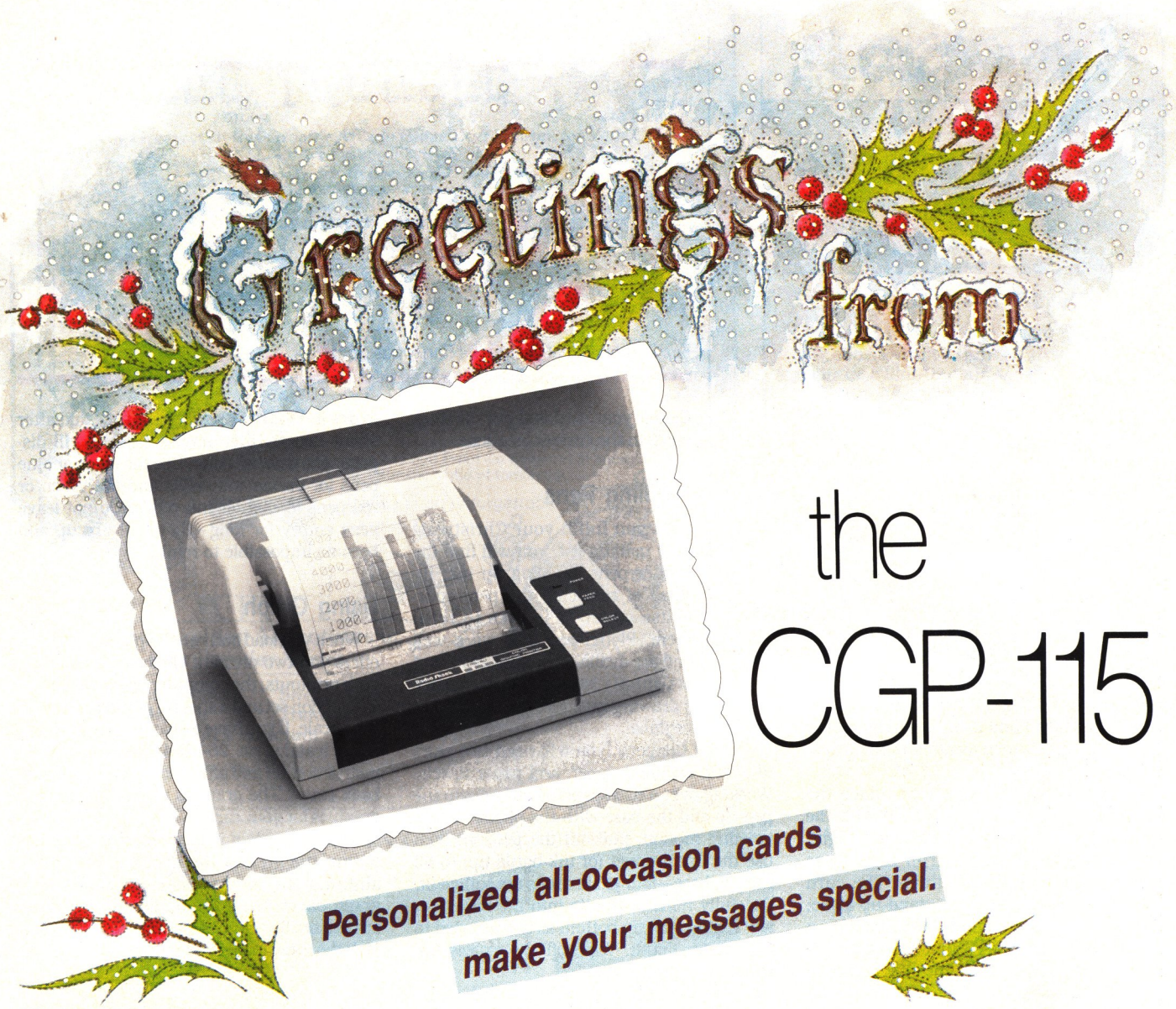
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by John B. Shaw

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At first, I used my CGP-115 printer almost exclusively to print program listings. Gaining experience, I found more applications that used its graphics capabilities, and I developed programs that would be practical, impress my noncomputer friends, and even help pay for the system. Greeting (Listing 1) satisfies all the criteria; it prints personalized Christmas cards and leaves space for inclusion of a family photo on the inside. (See Fig. 1.) Graph (Listing 2) is an aid that takes the frustration out of creating greeting-card graphics. With it, you can expand your library to include cards for birthdays, anniversaries, and even party announcements.

Making a Christmas Card

Before you begin, make sure that you have an ample supply of pens and paper for the printer. When you load and run the program, Greeting asks for the sender's name. Input is limited to 20 characters and can be in upper- or lowercase. Use the same guidelines when you enter the recipient's name—the computer does the rest.

After the printer has drawn four pages, the CoCo sounds a tone to signal completion of the card. Then the program loops back in preparation for the next card. You can edit lines 330 and 360 to change the Christmas message.

System Requirements

16K RAM
Color Basic
CGP-115 Printer

To make a card, you need a few simple supplies: scissors, rubber cement, a hobby knife, a straight-edge, and a wooden board or work surface. Construction is easy: You fold the pages of the card over, glue them to provide reinforcement, and cut slits so that you can insert a photograph. To begin, carefully cut the paper along the top and bottom blue-dotted lines. On a wooden board or an appropriate work surface, use a hobby knife to slit the four red diagonal lines on the first page. Fold the paper at the center dotted line with the printing facing out. Crease to a sharp edge.

Open the card and lay it print-side down. Fold each end in half so that the ends meet at the center of the unprinted side. When the ends are aligned, crease these edges also. You have now formed the basic card. Apply a coat of rubber cement to the back of page 4 and bond it to the back of page 3, aligning

Illustration by Parker Leighton

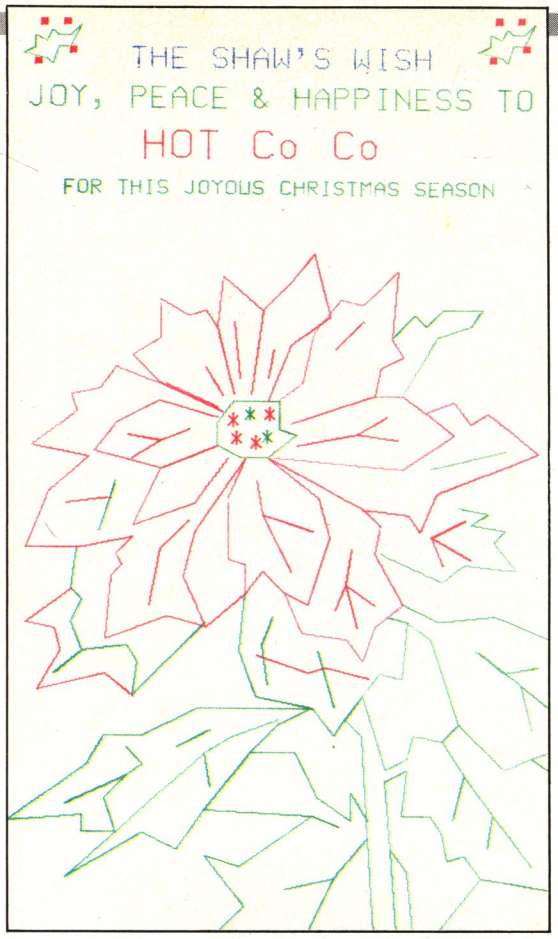


Fig. 1. The Front Cover of a Personalized Christmas Card

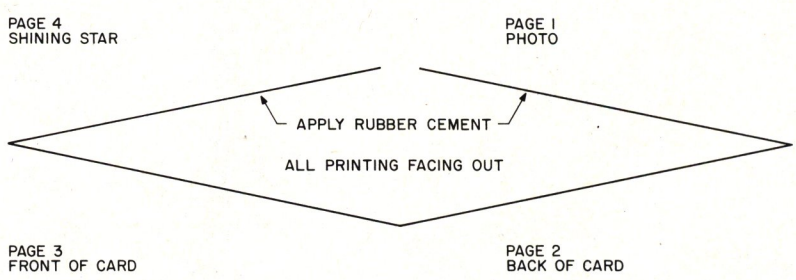


Fig. 2. Folding and Gluing the Christmas Card

them carefully. Repeat the bonding procedure with pages 1 and 2, but keep the rubber cement at least ½ inch away from the diagonal slits. (See Fig. 2.)

When the cement has dried, place the folded card on your work surface with the back of the card facing up. Using a straightedge and a hobby knife, trim the excess edges at the two dotted lines. The card should be sturdy enough to stand up alone; the diagonal slits should accommodate a standard 35mm print—3½ inches wide by 5-inches high. The card will fit in a 4-inch by 9½-inch business envelope. If your photographs are not the proper size, eliminate the four diagonal lines by adding:

```
365 GOTO 470
```

Center your card and cut the diagonals in the correct locations.

Refilling Pens

As you fulfill your Christmas-card mailing list, you will find the printer pens gobbling up ink. Instead of replacing the pens, purchase water-base inks to refill them. Plotter-pen inks work well and are available at stationery and art-supply stores; good quality water-base drawing inks and stamp-pad inks are also acceptable.

To refill the pens, you will need two pairs of pliers, an eye dropper, and paper towels. Working over a newspaper, gently grasp the pen tip and the base with the pliers. With a twisting motion, pull out the pen tip; then use the eye dropper (or ink-bottle tip) to fill the pen base—four to six drops are sufficient. Carefully reinsert the tip into the base; you will feel the pen tip bottom as it is inserted to the proper depth. Wipe off the excess ink with a paper towel.

If you would like to experiment with different ink colors, soak the empty disassembled pens in warm, soapy water overnight. Then flush the pen base with water. Insert a piece of tissue paper and a toothpick into the base to dry it. Fill the base with the new ink; after about two or three refills, the pen will dispense the true ink color. Use the black or blue pens for darker ink refills and the green or red pens for lighter ink refills. Do not leave pens empty for long—they will dry up and become impossible to reink.

Using Graph

When you load and run Graph, the program offers you two printout choices. If you select both printouts, the computer prints the CGP's instruction set and a sheet of graph paper with a 1:1 scale. If you have a *Color Computer Quick Guide* (catalog no. 26-3194), you can cut the instruction set and affix it to the guide's inside back cover. The graph is useful for drawing graphics for your cards.

Obtain a sketch, picture, or photo that fits within the area of the graph paper. After aligning the picture, carbon paper, and graph paper, trace the outline you want to appear on the card. To create the drawing, pick the coordinates from the graph paper. ■

Address correspondence to John B. Shaw, 4611 Old Linden Hill Road, Wilmington, DE 19808.

Program Listing 1. Greeting

```
1Ø 'CHRISTMAS CARD BY JOHN SHAW
2Ø PRINT#-2,CHR$(17)
3Ø PRINT#-2,CHR$(13)
4Ø CLS
5Ø PRINT"SENDER'S NAME OR FAMILY
 TITLE"
6Ø PRINT"EXAMPLE     > THE SHAW'S
 <"
7Ø PRINT"LIMIT TO 2Ø CHARACTERS"
8Ø INPUTS$
9Ø S= LEN(S$):SS=INT((22-S)/2)
1ØØ FOR X= 1 TO SS
11Ø SS$=SS$+" "
12Ø NEXT X
13Ø SS$=SS$+S$+" WISH"
14Ø CLS
15Ø PRINT"ENTER CARD RECIPIENT'S
 NAME"
16Ø PRINT"EXAMPLE    > THE SMITH'
S <"
17Ø PRINT"LIMIT 2Ø CHARACTERS"
18Ø INPUT N$
19Ø CLS
2ØØ PRINT"PRINTING CARD"
21Ø 'PRINT FIRST PAGE
22Ø PRINT#-2,CHR$(18)
23Ø PRINT#-2,"C1"
24Ø PRINT#-2,"RØ,-3ØØ"
25Ø PRINT#-2,"L15"
26Ø PRINT#-2,"J48Ø,Ø"
27Ø PRINT#-2,"R-48Ø,Ø"
28Ø PRINT#-2,"RØ,-4Ø"
29Ø PRINT#-2,"I"
3ØØ PRINT#-2,"RØ,-5Ø"
31Ø PRINT#-2,"C2"
32Ø PRINT#-2,"S1"
33Ø PRINT#-2,"P    MAY CHRIST SH
INE HIS LIGHT INTO"
34Ø PRINT#-2,"H"
35Ø PRINT#-2,"RØ,-8Ø"
36Ø PRINT#-2,"P      YOUR HOME A
S HE HAS IN OURS"
37Ø PRINT#-2,"C3"
38Ø PRINT#-2,"LØ"
39Ø PRINT#-2,"M15,-2ØØ"
4ØØ PRINT#-2,"D75,-125"
41Ø PRINT#-2,"M4ØØ,-125"
42Ø PRINT#-2,"D465,-2ØØ"
43Ø PRINT#-2,"M15,-675"
44Ø PRINT#-2,"D75,-75Ø"
```

Listing continued

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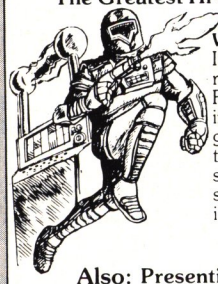
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SUPER ACTION!

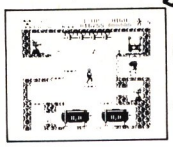
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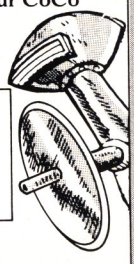
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Good Luck!





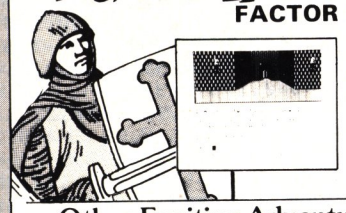
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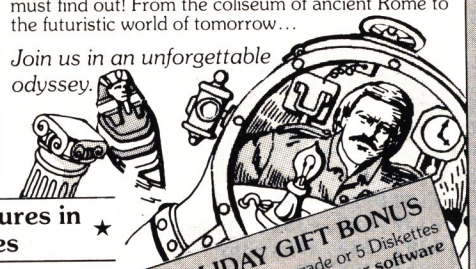
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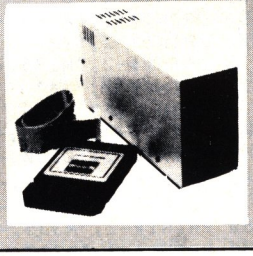
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45Ø PRINT#-2,"M465,-675"
46Ø PRINT#-2,"D4ØØ,-75Ø"
47Ø PRINT#-2,"M1Ø,-76Ø"
48Ø GOSUB 214Ø
49Ø PRINT#-2,"M42Ø,-765"
5ØØ GOSUB214Ø
51Ø PRINT#-2,"MØ,-8ØØ"
52Ø ' PRINT PAGE 2
53Ø PRINT#-2,"L15"
54Ø PRINT#-2,"I"
55Ø PRINT#-2,"C1"
56Ø PRINT#-2,"DØ,-8ØØ"
57Ø PRINT#-2,"D48Ø,-8ØØ"
58Ø PRINT#-2,"D48Ø,Ø"
59Ø PRINT#-2,"LØ"
6ØØ PRINT#-2,"M32Ø,-3Ø"
61Ø PRINT#-2,"SØ"
62Ø PRINT#-2,"C3"
63Ø PRINT#-2,"Q2"
64Ø PRINT#-2,"Pcopyright 1983 by
 John Shaw"
65Ø PRINT#-2,"QØ"
66Ø PRINT#-2,"S1"
67Ø PRINT#-2,"MØ,-8ØØ"
68Ø PRINT#-2,"LØ"
69Ø 'PRINT PAGE 3
7ØØ PRINT #-2,CHR$(17);CHR$(13);
CHR$(18)
71Ø PRINT#-2,"I"
72Ø 'GREEN LEAF AND STEM
73Ø PRINT#-2,"C2"
74Ø PRINT#-2,"M34Ø,-275"
75Ø PRINT#-2,"D36Ø,-255,37Ø,-265
,385,-25Ø,42Ø,-25Ø,41Ø,-265,38Ø,
-275,35Ø,-325"
76Ø PRINT#-2,"M375,-39Ø"
77Ø PRINT#-2,"D44Ø,-375"
78Ø PRINT#-2,"M4ØØ,-425"
79Ø PRINT#-2,"D425,-43Ø,41Ø,-44Ø
,44Ø,-445,43Ø,-455,45Ø,-48Ø,4Ø5,
-475,385,-49Ø,33Ø,-465"
8ØØ PRINT#-2,"M35Ø,-51Ø"
81Ø PRINT#-2,"D38Ø,-525,43Ø,-52Ø
,48Ø,-54Ø"
82Ø PRINT#-2,"M47Ø,-565"
83Ø PRINT#-2,"D44Ø,-57Ø,415,-55Ø
,48Ø,-6ØØ,455,-58Ø,465,-62Ø"
84Ø PRINT#-2,"M48Ø,-64Ø"
85Ø PRINT#-2,"D465,-645,48Ø,-655
,465,-645,44Ø,-655,4ØØ,-615,375,
-54Ø,355,-525,335,-52Ø,355,-525,
35Ø,-575,33Ø,-57Ø,315,-59Ø,335,-
655,355,-645,36Ø,-625,385,-63Ø,4
ØØ,-615,385,-63Ø"
86Ø PRINT #-2, "D4Ø5,-66Ø,395,-7
ØØ,4Ø5,-66Ø,43Ø,-695,425,-725,43
Ø,-695,465,-74Ø"
87Ø PRINT #-2, "M38Ø,-8ØØ"
88Ø PRINT#-2,"D42Ø,-75Ø,48Ø,-76Ø
,42Ø,-75Ø,4Ø5,-73Ø,39Ø,-735,385,
-71Ø,375,-695,35Ø,-695,355,-655,
335,-665,34Ø,-725,345,-8ØØ,34Ø,-
725,355,-745,36Ø,-8ØØ"
89Ø PRINT#-2,"M325,-8ØØ"
9ØØ PRINT#-2,"D32Ø,-715,29Ø,-75Ø
,265,-8ØØ,29Ø,-75Ø,245,-76Ø,29Ø,
-75Ø,32Ø,-715,315,-625,3ØØ,-61Ø,
315,-59Ø,3ØØ,-61Ø,29Ø,-625,27Ø,-
6ØØ,24Ø,-615,215,-64Ø,255,-64Ø,2
75,-68Ø,3Ø5,-7ØØ,3Ø5,-675,32Ø,-7
ØØ"
91Ø PRINT#-2,"M185,-8ØØ"
92Ø PRINT#-2,"D21Ø,-775,175,-73Ø
,2Ø5,-74Ø,27Ø,-695,295,-7Ø5,27Ø,
-695,175,-69Ø,215,-64Ø,175,-69Ø,
15Ø,-725,12Ø,-71Ø,5Ø,-75Ø,175,-6
4Ø,18Ø,-67Ø,175,-64Ø,2ØØ,-625,24
Ø,-61Ø"
93Ø PRINT#-2,"M18Ø,-62Ø"
94Ø PRINT#-2,"D15Ø,-635"
95Ø PRINT#-2,"M27Ø,-6ØØ"
96Ø PRINT#-2,"D17Ø,-6ØØ,12Ø,-625
,85,-625,7Ø,-65Ø,Ø,-7ØØ,65,-695,
65,-71Ø,95,-71Ø,85,-68Ø,1Ø5,-66Ø
,5Ø,-685,1Ø5,-66Ø,12Ø,-65Ø,1Ø5,-
635"
97Ø PRINT#-2,"M27Ø,-6ØØ"
98Ø PRINT#-2,"D22Ø,-59Ø,2Ø5,-55Ø
,21Ø,-5ØØ"
99Ø PRINT#-2,"M235,-52Ø"
1ØØØ PRINT#-2,"D225,-545,23Ø,-58
Ø"
1Ø1Ø PRINT#-2,"M275,-55Ø"
1Ø2Ø PRINT#-2,"D29Ø,-6ØØ"
1Ø3Ø PRINT#-2,"M175,-525"
1Ø4Ø PRINT#-2,"D11Ø,-59Ø,115,-56
Ø,1Ø5,-545,65,-55Ø,4Ø,-57Ø,65,-5
5Ø,55,-525,65,-5Ø5,55,-495,6Ø,-4
6Ø"
1Ø5Ø PRINT#-2,"M95,-4ØØ"
1Ø6Ø PRINT#-2,"D8Ø,-445"
1Ø7Ø PRINT#-2,"M255,-36Ø"'START
INNER CIRCLE
1Ø8Ø PRINT#-2,"D24Ø,-355,24Ø,-33
Ø,2ØØ,-33Ø,185,-35Ø,185,-37Ø,2Ø5
,-38Ø,23Ø,-38Ø,255,-36Ø"
1Ø9Ø 'DRAW CENTER
11ØØ PRINT#-2,"M225,-37Ø"
111Ø PRINT#-2,"P*"
112Ø PRINT#-2,"M21Ø,-35Ø"
113Ø PRINT#-2,"P*"
114Ø PRINT#-2,"M227,-35Ø"
115Ø PRINT#-2,"C3"
116Ø PRINT#-2,"P*"
117Ø PRINT#-2,"M215,-375"
118Ø PRINT#-2,"P*"
119Ø PRINT#-2,"M198,-371"
12ØØ PRINT#-2,"P*"
121Ø PRINT#-2,"M195,-355"
122Ø PRINT#-2,"P*"
123Ø 'RED LEAF
124Ø PRINT#-2,"M235,-285"
125Ø PRINT#-2,"D23Ø,-31Ø"
126Ø PRINT#-2,"M315,-26Ø"
127Ø PRINT#-2,"D29Ø,-285"
128Ø PRINT#-2,"M335,-345"
129Ø PRINT#-2,"D31Ø,-36Ø,255,-37
Ø,31Ø,-36Ø,345,-365"
13ØØ PRINT#-2,"M375,-45Ø"
131Ø PRINT#-2,"D4Ø5,-435,375,-45
Ø,41Ø,-47Ø,375,-45Ø,385,-475"
132Ø PRINT#-2,"M3ØØ,-492"
133Ø PRINT#-2,"D3Ø5,-46Ø,3ØØ,-49
2,29Ø,-515,3ØØ,-492,31Ø,-53Ø,3ØØ
,-492,325,-51Ø"
134Ø PRINT#-2,"M25Ø,-48Ø"
135Ø PRINT#-2,"D235,-45Ø,225,-43
Ø,27Ø,-445,225,-43Ø,22Ø,-4ØØ"
136Ø PRINT#-2,"M125,-51Ø"
137Ø PRINT#-2,"D135,-46Ø,16Ø,-43
5"
138Ø PRINT#-2,"M9Ø,-415"
139Ø PRINT#-2,"D5Ø,-42Ø"
14ØØ PRINT#-2,"M11Ø,-38Ø"
141Ø PRINT#-2,"D135,-365,1Ø5,-36
Ø,135,-365,16Ø,-355"
142Ø PRINT#-2,"M185,-335"
143Ø PRINT#-2,"D14Ø,-315"
144Ø PRINT#-2,"M19Ø,-325"
145Ø PRINT#-2,"D175,-3ØØ"
146Ø PRINT#-2,"M2Ø5,-31Ø"
147Ø PRINT#-2,"D2ØØ,-26Ø"
148Ø PRINT#-2,"M22Ø,-555"
149Ø PRINT#-2,"D265,-57Ø,28Ø,-56
5,32Ø,-575"
15ØØ PRINT#-2,"M11Ø,-59Ø"
151Ø PRINT#-2,"D85,-57Ø,25,-585,
45,-55Ø,4Ø,-53Ø,15,-525,55,-495"
152Ø 'OUTSIDE OF FLOWER
153Ø PRINT#-2,"M27Ø,-2ØØ"
154Ø PRINT#-2,"D25Ø,-225,225,-25
Ø,215,-325,225,-25Ø,19Ø,-22Ø,185
,-265,2ØØ,-325,185,-265,175,-25Ø
,16Ø,-255,135,-24Ø,135,-275,11Ø,
-29Ø,135,-315,19Ø,-34Ø,135,-315,
95,-3ØØ,8Ø,-32Ø,55,-325,6Ø,-34Ø,
2Ø,-37Ø,7Ø,-38Ø,35,-41Ø,15,-46Ø,
6Ø,-46Ø"
155Ø PRINT#-2,"D11Ø,-45Ø,95,-465
,1ØØ,-475,9Ø,-485,85,-54Ø,14Ø,-5
2Ø,175,-53Ø,155,-485,165,-445,21
Ø,-38Ø,195,-415,195,-47Ø,21Ø,-47
5,21Ø,-5ØØ,175,-53Ø"
156Ø PRINT#-2,"D21Ø,-5ØØ,225,-48
Ø,245,-5ØØ,265,-51Ø,285,-45Ø,275
,-415,23Ø,-38Ø,315,-425,33Ø,-44Ø
,325,-465,35Ø,-51Ø,325,-53Ø,315,
-56Ø,3ØØ,-54Ø,26Ø,-535,245,-5ØØ"
157Ø PRINT#-2,"M315,-425"
158Ø PRINT#-2,"D355,-43Ø,365,-44
5,38Ø,-41Ø,47Ø,-375,425,-34Ø,41Ø
,-35Ø,395,-33Ø,37Ø,-34Ø,395,-36Ø
,35Ø,-39Ø,235,-38Ø"
159Ø PRINT#-2,"M37Ø,-34Ø"
16ØØ PRINT#-2,"D35Ø,-325,325,-32
5,25Ø,-35Ø,325,-325,33Ø,-3ØØ,35Ø
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-33Ø"
161Ø PRINT#-2,"M23Ø,-33Ø"
162Ø PRINT#-2,"D25Ø,-28Ø,285,-25
5,27Ø,-2ØØ"
163Ø PRINT#-2,"M185,-345"
164Ø PRINT#-2,"D135,-33Ø,95,-35Ø
,75,-375,135,-39Ø,185,-37Ø,135,-
39Ø,11Ø,-44Ø,165,-42Ø,195,-38Ø"
165Ø PRINT#-2,"H"
166Ø PRINT#-2,"C1"
167Ø PRINT#-2,"S2"
168Ø PRINT#-2,"MØ,-4Ø"
169Ø PRINT#-2,"P";SS$
17ØØ PRINT#-2,"MØ,-75"
171Ø PRINT#-2,"S2"
172Ø PRINT#-2,"C2"
173Ø PRINT#-2,"P JOY, PEACE & HA
PPINESS TO"
174Ø PRINT#-2,"MØ,-12Ø"
175Ø N=LEN(N$)
176Ø PRINT#-2,"C3"
177Ø PRINT#-2,"S3"
178Ø S=INT((2Ø-N)/2)
179Ø FOR C=1 TO S
18ØØ PRINT#-2,"P "
181Ø NEXT C
182Ø PRINT#-2,"P";N$
183Ø PRINT#-2,"MØ,-15Ø"
184Ø PRINT#-2,"C2"
185Ø PRINT#-2,"S1"
186Ø PRINT#-2,"P    FOR THIS JOY
OUS CHRISTMAS SEASON"
187Ø PRINT#-2,"M12,-25"
188Ø GOSUB 214Ø
```

```
189Ø PRINT#-2,"M415,-21"
19ØØ GOSUB 214Ø
191Ø PRINT#-2,"MØ,-8ØØ"
192Ø 'PRINT LAST PAGE
193Ø PRINT#-2,"I"
194Ø PRINT#-2,"C1"
195Ø PRINT#-2,"M35Ø,-5Ø"
196Ø PRINT#-2,"D375,-11Ø,45Ø,-11
Ø,39Ø,-16Ø,42Ø,-24Ø,35Ø,-18Ø,29Ø
,-24Ø,315,-16Ø,26Ø,-1ØØ,33Ø,-11Ø
,35Ø,-5Ø"
197Ø PRINT#-2,"L15"
198Ø PRINT#-2,"M25Ø,-15Ø"
199Ø PRINT#-2,"D5Ø,-4ØØ"
2ØØØ PRINT#-2,"M25Ø,-3ØØ"
2Ø1Ø PRINT#-2,"D5Ø,-7ØØ"
2Ø2Ø PRINT#-2,"M35Ø,-3ØØ"
2Ø3Ø PRINT#-2,"D125,-75Ø"
2Ø4Ø PRINT#-2,"M44Ø,-3ØØ"
2Ø5Ø PRINT#-2,"D3ØØ,-65Ø"
2Ø6Ø PRINT#-2,"MØ,-825"
2Ø7Ø PRINT#-2,"J48Ø,Ø"
2Ø8Ø PRINT#-2,"CØ"
2Ø9Ø PRINT#-2,"MØ,-99Ø"
21ØØ PRINT#-2,"A"
211Ø SOUND5Ø,5Ø
212Ø GOTO 14Ø
213Ø END
214Ø 'HOLLY LEAF GRAPHICS
215Ø PRINT#-2,CHR$(18):PRINT#-2,
"C2"
216Ø PRINT#-2,"J1Ø,5,Ø,1Ø,1Ø,-5,
5,1Ø,5,-5,1Ø,Ø,1Ø,1Ø,-1Ø,-2Ø,-1Ø
,Ø,-5,-15,-5,5,-2Ø,5"
217Ø PRINT#-2,"R15,25"
218Ø GOSUB 226Ø
219Ø PRINT#-2,"R2Ø,Ø"
22ØØ GOSUB 226Ø
221Ø PRINT#-2,"R5,-25"
222Ø GOSUB 226Ø
223Ø PRINT#-2,"R-3Ø,-1Ø"
224Ø GOSUB 226Ø
225Ø RETURN
226Ø PRINT#-2,"C3"
227Ø PRINT#-2,"J5,Ø,Ø,1,-5,Ø,Ø,1
,5,Ø,Ø,1,-5,Ø,Ø,1,5,Ø,Ø,1,-5,Ø,Ø
,-5"
228Ø RETURN
```

Program Listing 2. Graph

```
2Ø 'DISPLAYS PRINTER COORDINATE
GRID & COMMANDS
3Ø CLS:PRINT#-2,CHR$(17)
4Ø FOR LF=1 TO 5:PRINT#-2,CHR$(1
Ø):NEXT LF
5Ø FOR T=1 TO 3ØØ
6Ø PRINT@263,"GRAPH BY JOHN SHAW
";:NEXT T
7Ø CLS:PRINT:PRINT
8Ø PRINT"THIS PROGRAM WILL DISPL
AY","CGP-115 COMMANDS AND THE","
ABSOLUTE ACCESSIBLE COORDINATE
 GRID ON A 48Ø X 99Ø GRAPH","ACC
ESSED BY ABSOLUTE","X,Y COORDINA
TES",,"EACH GRAPH LINE = 1Ø POIN
TS"
9Ø PRINT:PRINT:INPUT"DO YOU WISH
 COMMANDS PRINTED    <Y OR N>";C
$
1ØØ INPUT"DO YOU WANT A COORDINA
TE GRAPH  <Y OR N>";G$
11Ø IF C$="N" THEN 56Ø
12Ø CLS:PRINT@267,"PRINTING"
13Ø PRINT#-2,CHR$(29);CHR$(29);C
HR$(29)
14Ø PRINT#-2,TAB(4);"******* PRI
NTER  COMMANDS *******";CHR$(1Ø)
;CHR$(1Ø);CHR$(29);CHR$(29);CHR$
(29)
15Ø PRINT#-2,TAB(12);"<<TEXT COM
MANDS>>";CHR$(1Ø);CHR$(29);CHR$(
29);CHR$(29)
16Ø PRINT#-2,"PRINT#-2,CHR$(17)
= select text mode"
17Ø PRINT#-2,"PRINT#-2,CHR$(18)
= select graphic mode"
18Ø PRINT#-2,"PRINT#-2,CHR$(Ø8)
= back space"
19Ø PRINT#-2,"PRINT#-2,CHR$(1Ø)
= line feed"
2ØØ PRINT#-2,"PRINT#-2,CHR$(11)
= reverse line feed"
21Ø PRINT#-2,"PRINT#-2,CHR$(13)
= carriage return"
22Ø PRINT#-2,"PRINT#-2,CHR$(29)
= change pen color"
23Ø PRINT#-2,CHR$(1Ø);CHR$(29)
24Ø PRINT#-2,TAB(11);"<<GRAPHIC
COMMANDS>>";CHR$(1Ø);CHR$(29);CH
R$(29);CHR$(29)
25Ø PRINT#-2,"PRINT#-2,'A'"
26Ø PRINT#-2,"moves pen to left
margin, resets origin & returns
to text; without drawing.";CHR$(
1Ø)
27Ø PRINT#-2,"PRINT#-2,'C number
'"
28Ø PRINT#-2, "change pen, Ø=bla
ck,1=blue,2=green,3=red";CHR$(1Ø
)
29Ø PRINT#-2,"PRINT#-2,'H'"
3ØØ PRINT#-2,"moves pen to curre
nt orign, no draw";CHR$(1Ø)
31Ø PRINT#-2,"PRINT#-2,'I'"
32Ø PRINT#-2, "initilize pen ori
gin to current position";CHR$(1Ø
)
33Ø PRINT#-2,"PRINT#-2,'L type'
(changes line style)"
34Ø PRINT#-2, "type=Ø to 15, Ø=s
olid line, 15=wide dash";CHR$(1Ø
)
35Ø PRINT#-2,"PRINT#-2,'P string
' (prints text)"
36Ø PRINT#-2,"string=text charac
ters";CHR$(1Ø)
37Ø PRINT#-2,"PRINT#-2,'S size'
(changes print size)"
38Ø PRINT#-2, "size=print size Ø
 to 63, cpl=8Ø/(size+1)";CHR$(1Ø
)
39Ø PRINT#-2,"PRINT#-2,'Q direct
ion' (print direction)"
4ØØ PRINT#-2,"direction=Ø to 3,
Ø=normal, 1=top-to-"
41Ø PRINT#-2,"bottom, 2=upside d
own, 3=bottom-to-top";CHR$(1Ø)
42Ø PRINT#-2,"PRINT#-2,'D coordi
nate' (draws a line)"
43Ø PRINT#-2,"to coordinate...
X=+-48Ø, Y=+-999";CHR$(1Ø)
44Ø PRINT#-2,"PRINT#-2,'M coordi
nate' (move no draw)"
45Ø PRINT#-2,"to coordinate... X
=+-48Ø, Y=+-999";CHR$(1Ø)
46Ø PRINT#-2,"PRINT#-2,'J direct
ion' (draws a line)"
47Ø PRINT#-2,"X=+right -left 1 t
o 48Ø ,"
48Ø PRINT#-2,"Y=+up -down 1 to 9
99";CHR$(1Ø)
49Ø PRINT#-2,"PRINT#-2,'R direct
ion' (move no draw)"
5ØØ PRINT#-2,"X=+right -left 1 t
o 48Ø ,"
51Ø PRINT#-2,"Y=+up -down 1 to 9
99";CHR$(1Ø)
52Ø PRINT#-2,"PRINT#-2,'X a,s,i'
 (draws a x,y gr axis)"
53Ø PRINT#-2,"a=axis to be drawn
 1=x,Ø=y"
54Ø PRINT#-2,"s=steps of measure
ment marks +- 1 to 999"
 55Ø PRINT#-2,"i=# of measurment
marks to be repeated";CHR$(1Ø)
56Ø IF G$="N" THEN 1Ø6Ø
57Ø CLS:PRINT@267,"DRAWING"
58Ø PRINT#-2,CHR$(18);"CØ"
59Ø FOR Y=Ø TO 24
6ØØ PRINT#-2,"JØ,-99Ø"
61Ø PRINT#-2,"R1Ø,Ø"
62Ø PRINT#-2,"JØ,99Ø"
63Ø PRINT#-2,"R1Ø,Ø"
64Ø NEXT Y
65Ø PRINT#-2,"H"
66Ø FOR X=1 TO 5Ø
67Ø PRINT#-2,"J48Ø,Ø"
68Ø PRINT#-2,"RØ,-1Ø"
69Ø PRINT#-2,"J-48Ø,Ø"
7ØØ PRINT#-2,"RØ,-1Ø"
71Ø NEXT X
72Ø PRINT#-2,"I"
73Ø PRINT#-2,"C3"
74Ø PRINT#-2,"SØ"
75Ø PRINT#-2,"Q3"
76Ø PRINT#-2,"M1Ø,Ø"
77Ø FOR N=Ø TO 95 STEP 5
78Ø N$=STR$(N)
79Ø P$="P"+N$
8ØØ PRINT#-2,P$
81Ø N1=(N+5)*1Ø
82Ø N1$=STR$(N1)
83Ø M$="M1Ø,"+N1$
84Ø PRINT#-2,M$
85Ø NEXT N
86Ø PRINT#-2,"H"
87Ø PRINT#-2,"RØ,-1Ø"
88Ø PRINT#-2,"I"
89Ø FOR N= 5 TO 45 STEP 5
9ØØ N1=(N*1Ø)+4
91Ø N$=STR$(N)
92Ø N1$=STR$(N1)
93Ø M$="M"+N1$+",Ø"
94Ø P$="P"+N$
95Ø PRINT#-2,M$
96Ø PRINT#-2,P$
97Ø NEXT N
98Ø PRINT#-2,"H"
99Ø PRINT#-2,"RØ,-2Ø"
1ØØØ PRINT#-2,"S1"
1Ø1Ø PRINT#-2,"C2"
1Ø2Ø PRINT#-2,"A"
1Ø3Ø PRINT#-2,"X = GRID NUMBER *
 1Ø,  SCALE Ø TO 48Ø"
1Ø4Ø PRINT#-2,"Y = GRID NUMBER *
 1Ø,  SCALE Ø TO 999"
1Ø5Ø GOTO1Ø6Ø
1Ø6Ø PRINT#-2,CHR$(17);CHR$(1Ø);
CHR$(1Ø)
1Ø7Ø END
```

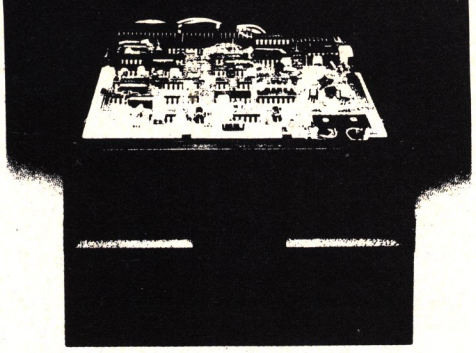
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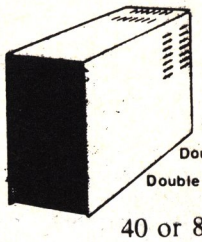
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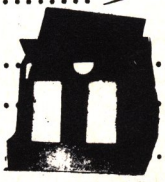
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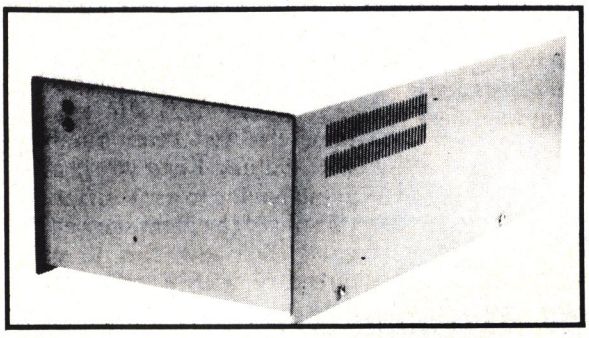
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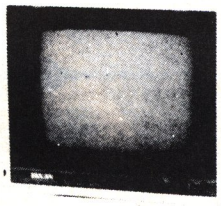
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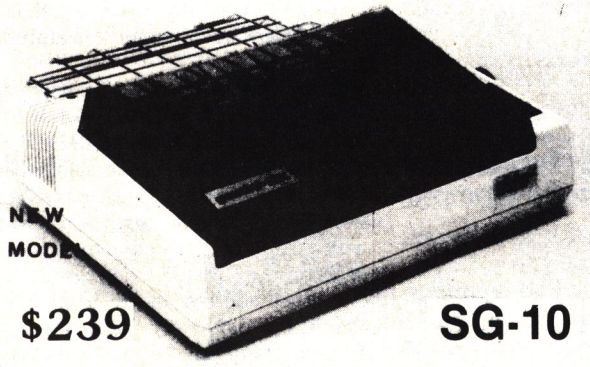
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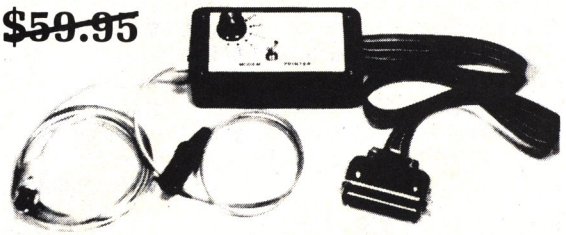
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by Richard E. Esposito

Doctor ASCII's Best Bets for Christmas

Stumped on a gift for a CoCo-using friend? The good doctor has some ideas.

Every year around Christmas I get letters asking about what to buy for your CoCo. So in anticipation of those cards and letters rolling in, here are my ideas for the 1985 holiday season.

Hardware Under $10

● *Eight 4164 Memory Chips* (available through numerous sources): These chips will upgrade most 16K CoCos to 64K RAM memory.

Hardware Under $100

● *Tandy Multi-Pak Interface* (Radio Shack catalog no. 26-3144; $99.95): You can add up to four hardware accessories to your CoCo with this device.

● *CoCo Max* (Colorware Inc., 78-03B Jamaica Ave., Woodhaven, NY 11421, 718-647-2864; $69.95): Emulate an Apple Macintosh running MacPaint.

● *HJL-57 Keyboard* (HJL Products, 955 Buffalo Road, P.O. Box 24954, Rochester, NY 14624, 1-800-828-6968; $79.95): This is the best CoCo keyboard. It's especially nice if you have an old CoCo with chiclet keys.

Hardware Under $300

● *Star Micronics SG-10 Printer* (Computer Plus, P.O. Box 1094, 480 King St., Littleton, MA 01460, 800-343-8124; $245): The SG-10 has a very impressive near-letter-quality print mode that rivals daisy-wheel quality. Get it with an external serial-to-parallel converter.

● *Teac Double-Sided Disk Drive with Power Supply and Controller Containing Radio Shack's DOS* (True Data Products, 195 Linwood St., P.O. Box 546, Linwood, MA 01525, 800-635-0300; $159.95 with case and power supply, $259.95 with RS DOS and controller. Polygon Computers, 1316 Wilshire Blvd., Suite 206, Los Angeles, CA 90017 213-483-8388; $279 with RS DOS and controller): If you are serious about computing, you will kick yourself later if you don't get double-sided drives.

● *PBJ's Word-Pak II and an 18-MHz or Better Monochrome Monitor* (PBJ Inc., P.O. Box 813, North Bergen, NJ 07047, 201-330-1898; $134.95. Monochrome monitors are available from numerous sources and cost $100-$150.): This combination turns your CoCo into a first-class computer with an 80 by 25 display that rivals machines costing much more (requires Y-cable or Multi-Pak interface for use with disk).

Word Processors

● *Telewriter-64* (Cognitec, 704 N. Nob St., Del Mar, CA 92014, 619-755-1258; $49.95 cassette, $59.95 disk): The first one to offer a high-resolution 51 by 24 display is also easy to learn.

● *Elite-Word (Word-Pak version)* (Elite Software, 201 Penn Center Blvd., Suite 301, Pittsburgh, PA 15235, 412-795-8492; $79.95 disk or tape): If you want an 80-column screen and to stick with RS DOS, this is your baby.

● *Stylograph III with Flex or OS-9* (Stylo Software Inc., P.O. Box 916, 482 C St., Idaho Falls, ID 83402, 208-529-3210; $99.95 disk, Flex or OS-9 version): Stylograph supports full proportional spacing. With this, who needs the standard Flex or OS-9 editor?

Spreadsheets

● *Dynacalc for RS DOS, Flex, or OS-9* (Computer Systems Center, 42 Four Seasons Center #122, Chesterfield, MO 63017, 314-576-5020; $99.95 64K disk): The RS DOS version rivals Lotus 1-2-3, and it functions very much like VisiCalc.

● *Elite-Calc (Word-Pak version)* (Elite Software, see address above; $79.95 disk). As with Elite-Word, this combination is the way to go if you want an 80-column screen with RS DOS.

Operating Systems

● *ADOS for RS DOS 1.0 Only* (Spectro-Systems, 11111 N. Kendall Drive, Suite A108, Miami, FL 33176, 305-274-3899; $27.95 disk): ADOS adds many features to the original RS DOS without sacrificing compatibility. It should be burned into a 68766 EPROM.

● *FHL Flex* (Frank Hogg Laboratory, The Regency Tower, Suite 215, 770 James St., Syracuse, NY 13203, 315-474-7856; updated as XEX, $99.95 64K disk): Though out of favor due to Tandy's OS-9, Flex has a good software base and is easier to learn.

● *OS-9* (Radio Shack catalog no. 26-3030; $69.95 64K disk): OS-9 is the premiere operating system for the 6809. It is difficult to learn, but once mastered, you get a feeling of power.

Languages

● *Crunch Cobol for Flex* (Frank Hogg Laboratory, see address above; $100 64K disk): This is the best buy in CoCo Cobol. Microware's CIS Cobol has more features, but it costs $400.

● *Microware Pascal for OS-9* (Microware Systems Corp., 1866 N.W. 114th St., Des Moines, IA 50322, 515-224-1929; $100 64K disk): A very complete version, Microware Pascal compiles to p-code for testing, and then it can compile further to Assembly, which can be assembled to machine code.

● *Microware C for OS-9* (Microware Systems Corp., see address above; $100 64K disk): This C is another complete language from Microware. It, too, compiles to Assembly, and then it can be further compiled to machine code.

● *SDS80C Assembler for RS DOS* (The Micro Works, P.O. Box 1110, Del Mar, CA 92014, 619-942-2400; $89.95 ROM pack, $99.95 disk): SDS80C has more features than Tandy's EDTASM + , including a screen editor.

● *Basic-09 for OS-9* (Radio Shack catalog no.

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Much more than numbers

Besides the ten numeric keys, you get all four cursor keys, Clear, @, decimal point, Comma, Enter, and all four standard math keys.

Autoshifted Add and Multiply

One keystroke is all it takes to enter the Add and Multiply keys without shifting. Meanwhile the colon and semicolon are still instantly accessible from your main keyboard. What's more, NumberJack has its own shift key to provide convenient access to all the numeric shifted symbols.

Quick and easy installation

The completely self-contained NumberJack keypad can be installed in five minutes or less. No soldering, no drilling, and no special tools are required. Comes with complete instructions, a 3-foot plug-in cable and all necessary connectors.

HJL performance-- You can count on it

Bounce-Proof keyswitches are rated for 50 million cycles per key minimum and mounted on a solid aluminum baseplate. Contacts are covered by a protective membrane to guard against dirt, dust, and accidental spills. The NumberJack is built so well it carries a full, one-year warranty and the exclusive HJL Products 15-day money back guarantee.

Works with all color computers

Including Original, F-version, CoCo 2, TDP-100 and Dragon. Some CoCo 2 computers purchased after November, 1984 will require a special adapter ($3.00); just let us know the model number and we will add it to your order if required.

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26-3036; $99.95 64K disk): Basic-09 is similar to True Basic, offering a structured programming environment with many Pascal-like features for the CoCo.

Books

● Computer Fundamentals for an Information Age, *by Gary Shelley* (Anaheim Publishing): Learn to read computerese with this excellent introduction to computers, programming, and terminology.

● TRS-80 Color Computer Assembly Language Programming, *by William Barden, Jr.* (Radio Shack catalog no. 62-2077; $6.95): This bargain of a book is geared toward Tandy's EDTASM + editor/assembler.

● Assembly Language Graphics for the TRS-80 Color Computer, *by Don Inman* (Reston/Reward; $14.95): The material in this book uses The Micro Works' SDS80C editor/assembler.

● The Official Basic-09 Tour Guide, *by Dale Puckett* (Microware, see address above; $18.95): Tandy should have included this book with Basic-09 in the first place.

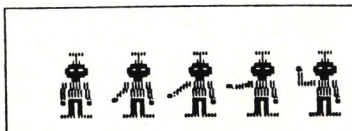
● The Complete Rainbow Guide to OS-9, *by Dale Puckett* (Falsoft, The Falsoft Building, Prospect, KY 40059, 502-228-4492; $19.95, $50.95 with two program disks): This book is a must for non-Unix users to learn OS-9. The first half is excellent, and the second half is quite technical. It is much easier to read than the Tandy manuals.

● 6809 Assembly Language Programming, *by Lance Leventhal* (Osborne/McGraw-Hill; $16.95): It's quite technical, but everything's there in this 6809er's bible. ■

Address correspondence to Richard Esposito, c/o HOT CoCo, *80 Pine St., Peterborough, NH 03458.*

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REVIEWED IN THE JANUARY '85 ISSUE OF THE RAINBOW

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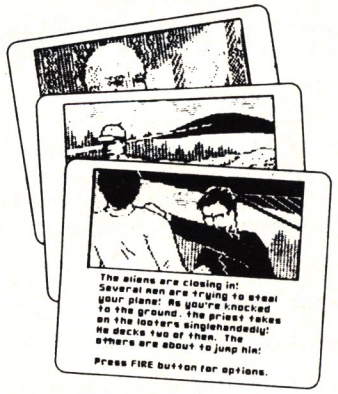


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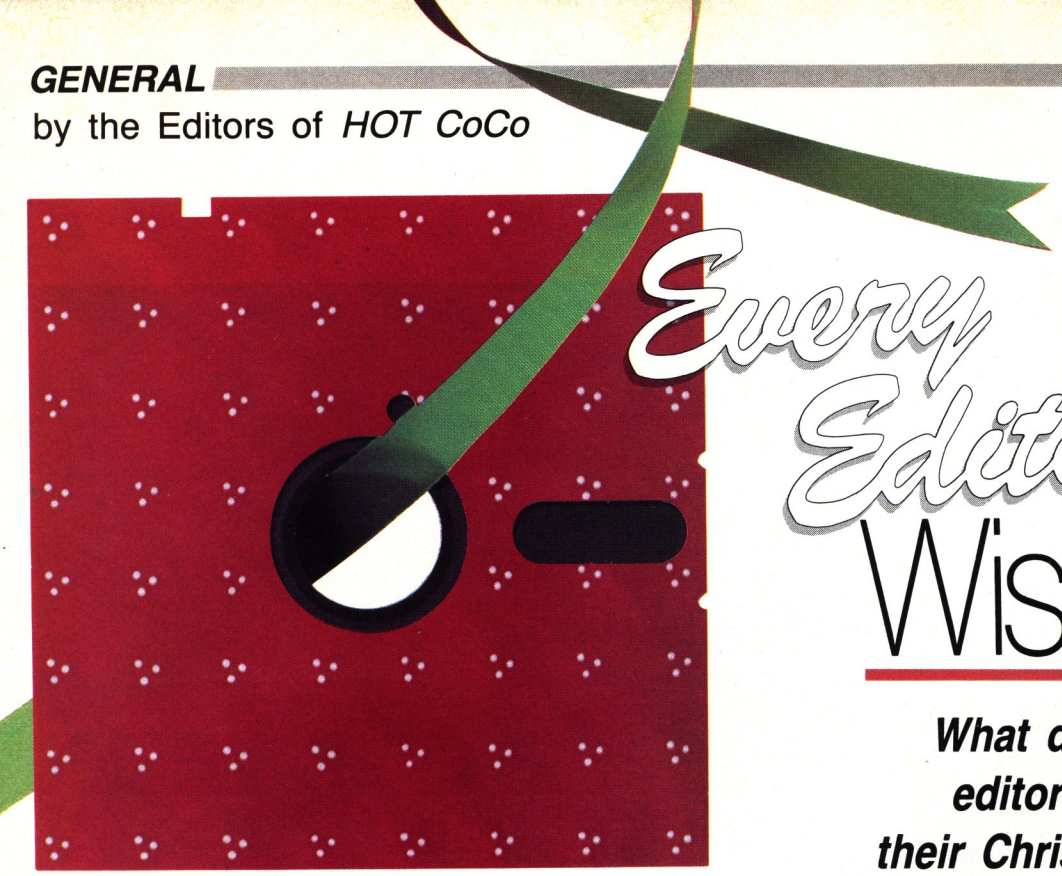
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Every Editor's Wish List

What do the HOT CoCo *editors hope to find in their Christmas stockings?*

Several years ago, as an editor for *80 Micro* magazine, I got a phone call from a reader looking for Level 2 ROMs for his daughter's TRS-80 Model I computer. She wanted them for Christmas. At the time I thought that a ROM chip was a pretty boring gift, even for a Model I owner.

The micro market has changed much since then, and this year the Color Computer owner has the most exciting software and peripherals ever to add to his or her Christmas wish list. In fact, the volume and variety of CoCo paraphernalia can overwhelm the wish-list maker.

To help you sort out the offerings this Christmas, the *HOT CoCo* editors, discriminating bunch that we are, have made our own gift choices. Each editor had the same criteria: Assume that you already have 64K of RAM and a disk drive; give no more than 10 items; list the manufacturer and the dealer with the best price; and explain the reason for your choice. Each editor also gives a brief background to his or her interests in the Color Computer.

Please keep in mind that the mention of any product here is not an absolute endorsement on the part of *HOT CoCo* magazine. It merely represents each individual's personal preference for a product doing a specific task.—M.N.

Marilyn G. McMaster, Copy Editor

For me, December is a time of holiday spirit and great expectations. Spreadsheets, databases, and utility programs—no matter how useful—are not the stuff dreams are made of. Come April, I might well wish that I had a program that would simplify record keeping and income-tax calculations, but in December, computer products that offer an element of surprise and encourage creativity are more attractive. My selection of hardware and software reflects a desire to get more enjoyment from the CoCo in the year to come; two favorite passtimes, doodling and armchair travel, figured prominently in my choices.

CoCo Max, *Colorware, 78-03 Jamaica Ave., Woodhaven, NY 11412, 718-647-2864; $69.95, and $27 for a Y-cable*

CoCo Max's icons and pull-down menus simplify program operation; powerful features such as cut, paste, edit pattern, and flip, make it a useful tool for graphic artists.

Bob's Magic Graphics Machine, *The Other Guy's Software, 875 South Main, Logan, UT 84321, 801-753-7620; $19.95*

Creating graphics screens in Extended Color Basic has never been this simple.

The Animator, *Triad Pictures, P.O. Box 1299, Sequim, WA 98382, 206-683-6459; $29.95*

Get an introduction to the basics of animation and produce a film that will run for 1 to 2 minutes. You have film, cels, and sound effects at your disposal.

Color Mouse, *Radio Shack catalog no. 26-3025*

The perfect drawing tool for CoCo Max. Once you adjust to the slippery feel, it is easy to create designs, dimension shapes, and move between functions. Computer Plus (P.O. Box 1094, 480 King St., Littleton, MA 01460, 800-343-8124) sells the Color Mouse for $44.

Star Micronics SG-10 Printer, *Star Micronics Inc., 200 Park Ave., New York, NY 10166, 214-631-8560*

The SG-10 outperforms other printers in its price bracket, producing graphics and near-letter-quality print at reasonable speeds. The bit-image graphics mode gives you 51,840 dots per square inch. White House Computer (P.O. Box 4025, Williamsport, PA 17701, 800-351-3442) sells it for $214.

Amdek 300 Color Monitor, *Amdek Corp., 2201 Lively Blvd., Elk Grove Village, IL 60007, 312-595-6890*

For graphics screens, a color monitor provides better resolution than that available on a TV set. White House Computer's price is $235.

Video Plus Monitor Driver, *Computerware, P.O. Box 668, Encinitas, CA 92924, 619-436-3512; $24.95*

You need monitor output to use a monitor.

Hitchiker's Guide to the Galaxy, *Infocom, 55 Wheeler St., Cambridge, MA 02138, 617-492-1031; price not available*

It appears that Infocom will finally distribute a CoCo version of the computer adaptation of Douglas Adams' zany galactic adventure. If you liked the book, you'll enjoy the game.

InvisiClues Hint Book, *Infocom; $7.95*

A well-timed clue can put you back in the game when you've reached an impasse. It's a sanity saver; don't leave Earth without it.

Wishbringer, *Infocom*

In the newest fantasy in the Infocom line,

you play a clerk in a seaside town. Unlike the other Infocom games, the outcome differs according to your actions. (My wish is that Infocom will port it to the CoCo.)

J. Scot Finnie, Review Editor

As the review editor of *HOT CoCo*, it's part of my job to look at all the hardware and software products that come through the door, everything from IC chips to integrated-software packages. The key point here is that I get to play with every one of them. So, what do I want for Christmas? I'd just like to get back to "work."

By now, it's probably apparent that you can't beat the Color Computer for availability of inexpensive software. Owners of other computers might pay twice as much or more in buying similar products for their machines. And there are a lot of programs to recommend the trusty CoCo. That's why it is so hard to come up with a modest list of stuff you might want to ask for or give this holiday season. The following are just some of the products I'm putting on my Christmas list this year. Keep in mind that prices might vary. And remember, good things come in big packages, too.

Autoterm, *PXE Computing, 11 Vicksburg Lane, Richardson, TX 75080; $39.95 cassette, $49.95 disk*

This top-rated terminal package does it all.

CBasic, *Cer-Comp, 5566 Ricochet Ave., Las Vegas, NV 89110, 702-452-0632; $149.95 disk*

The newest compiler on the market and the most promising. Look for a conclusive review in an upcoming issue.

Child Writer, *TCE Programs Inc., P.O. Box 2477, Gaithersburg, MD 20879-2477, 800-4TC-4TCE; $54.95 disk*

One of 1985's best programs, and a different approach to word processing. This program works best with a mouse interface.

CoCo Max, *(See address and price above.)*

Possibly the Color Computer program of the year. Destined to be the standard in CoCo graphics. Requires a Y-cable or multiple ROM-pack interface.

PenPal, *Four Star Software, P.O. Box 730, Streetsville, Ontario, L5M 2C2, Canada, 416-858-STAR; $69.95 disk*

This is a new integrated-business program that comprises a database, spreadsheet, word processor, terminal program, and graphics utility.

Tandy DMP-105 Printer, *Computer Plus, P.O. Box 1094, 480 King St., Littleton, MA 01460, 800-343-8124; $160*

This is an excellent dot-matrix printer for word processing and general text or program printouts.

The HJL-57 Keyboard, *HJL Products, 955 Buffalo Road, P.O. Box 24954, Rochester, NY 14624, 800-828-6968, 800-462-4891 in NY; $79.95*

The premiere replacement keyboard for the Color Computer, it offers full-height keys, bounce-proof keyswitches, and four function keys.

Tandy Multi-Pak Interface, *Computer Plus, P.O. Box 1094, 480 King St., Littleton, MA 01460, 800-343-8124; $89.95*

Allows you to switch between as many as four ROM packs or disk controllers.

Star Micronics SG-10, *(See address and price above.)*

The SG-10 is a dot-matrix printer that does graphics as well as text. Be sure to get a serial-to-parallel interface to go with it.

Word-Pak II, *PBJ Inc., P.O. Box 813, 5725 Kennedy Blvd., North Bergen, NJ 07047, 201-861-0126; $134.95*

This is a high-quality 80-column cartridge with a soft video switch and smooth scrolling.

Peter Paplaskas, Technical Editor

My interests in the CoCo vary quite a bit. Since my job involves some correspondence, and I am taking night courses, I find myself using the CoCo for word processing more than anything else. Programming is next in priority, both on the job and during my own time. Finally, I am always looking for good educational software for my preschool-age son.

The HJL-57 Keyboard, *HJL Products, 955 Buffalo Road, P.O. Box 24954, Rochester, NY 14624; $79.95*

Although the CoCo's stock keyboard has improved over the years, the HJL keyboard is still a great improvement. It offers full-travel, sculpted keys, including four function keys. The HJL keyboard can make typing those long term papers more comfortable.

The Nibble Notch II, *Nibble Notch Computer Products, 4211 NW 75th Terrace, Dept. 153, Lauderhill, FL 33319; $21.90*

This product allows you to use the other side of your disks, doubling your storage capacity. It makes a great practical gift, and it's a steal at the price.

Educational Software, *Dorsett Educational Systems, Box 1226, Norman, OK 73070; $8.80 each cassette, $14.95 each disk*

It is hard to find a quality line of software that ranges from grade K through adult. Dorsett seems to be filling the void. Software covering subjects such as algebra, government, and finance can be found in their catalog along with over 1,000 other titles.

OS-9, *Tandy Corp., 1800 One Tandy Center, Fort Worth, TX 76102; $69.95*

If you want to use high-level languages such as Pascal, Fortran, or Cobol, OS-9 is the way to go. Students of these languages can avoid waiting for lab time and study on their CoCos at home.

Mark E. Reynolds, Managing Editor

I look at the Color Computer much as the average *HOT CoCo* reader probably does. I'm not a programmer, nor am I one to take my machine apart and cut and solder to add different gadgets to give it more specialized capabilities. I am interested in the CoCo primarily as a word processor, and there are some additions that are necessary to accomplish this task.

Besides word processing, there are a few very powerful pieces of application software that help make the Color Computer a tool for serious work. And when the serious work is over, a good game can challenge the grey matter and keep the poor computerist happily engaged.

Smith-Corona L-1000 Daisy-Wheel Printer, *Sunlock Systems, 210 Connor Road, Mechanicsville, VA 23111, 800-368-9191; $249*

To me, a handsomely printed page is worth waiting for, and I rarely want to print graphics, so I choose letter-quality print over speed or graphics capabilities.

Telewriter-64, *Cognitec, 704 N. Nob St., Del Mar, CA 92014, 619-755-1258*

Besides the fact that this is an excellent word processor, its popularity means that clever users often publish enhancements they've developed to make it even better. Telewriter is one piece of software that is likely to become more useful, instead of more obsolete. Perry Computers (124 S. Main St., Perry, MI 48872, 800-248-3823) sells it for $42 on tape or $49 on disk.

Word-Pak II (see address and price above.)

This hardware device with special driver software gives you such features as an 80-character by 25-line display, true upper- and lowercase characters, and many graphics characters. Its a must for serious word processing.

Xtron Monitor, *White House Computer P.O. Box 4025, Williamsport, PA 17701, 800-351-3442; $179*

This 14-inch color monitor includes a speaker and monochrome capability, which is necessary for use with Word-Pak II. You can get a less expensive monochrome monitor, which is all you need for word processing, but I think the Color Computer deserves a color monitor. White House Computer also carries the Mark Data (24001 Alicia Parkway, No. 207, Mission Viejo, CA 92691, 714-768-1551) Universal Video Driver for $23.95 to connect the monitor to your computer.

Pro-Color-File *Enhanced* 2.0, *Derringer Software, P.O. Box 5300, Florence, SC 29502-2300, 803-665-5676*

A good database manager is a very handy way to keep and retrieve information. This one has the support of the Pro-Color-File National User's Group (see The Computer Room this issue for more information), so, as with Telewriter, you have a chance to pick up some valuable extras for the program. Selected Software (P.O. Box 32228, Fridley, MN 55432, 612-757-1026) sells Pro-Color-File for $49.95.

Dynacalc, *Computer Systems Center, 42 Four Seasons Center #122, Chesterfield, MO 63017, 314-576-5020*

Not every CoCo owner needs a spreadsheet, but I have to include this blockbuster program as one of the great pieces of Color Computer software. This list wouldn't be complete without it. Selected Software sells Dynacalc for $74.95.

The new Infocom adventures (See address above.)

There has been great rejoicing at the *HOT CoCo* offices since Infocom recently announced that it will be marketing its adventure games for the Color Computer. We have no price information yet, but they should be about $5 less than their $40-$50 MS-DOS counterparts.

Michael E. Nadeau, Editor in Chief

My primary use for a computer is word processing—everything from writing letters to editing the articles in this magazine. I also use spreadsheet programs and database managers in my work.

On my own time, I like to relax with a good game. I prefer a good strategy game over the shoot-em-ups. Adventures are also favorites of mine.

Telewriter-64 *(See address and price above.)*

For features and ease of use, Telewriter is the best word processor for me. It can also share data with two other programs on my list, Pro-Color-File and Dynacalc.

Child Writer *(See address and price above.)*

Child Writer is on my list because it is the only respectable word processor I've seen that you can learn without a manual. For quick-and-dirty work, it can't be beat.

Pro-Color-File *(See address and price above.)*

I'm a sucker for feature-packed DBMs, and Pro-Color-File is tops in features in the CoCo field. If the standard version isn't enough, Derringer Software sells several utilities to enhance Pro-Color-File more to your liking.

Dynacalc *(See address and price above.)*

This spreadsheet program is limited only by the CoCo's memory capacity. I like it for its similarity to VisiCalc in command structure.

Any Infocom Game *(See address above.)*

The *HOT CoCo* staff is in almost complete agreement on this. Infocom's impending entry into the CoCo market will wake up the adventure players among us.

Battle of the Bulge, *Ark Royal Games, P.O. Box 14806, Jacksonville, FL 32228; $29.95*

I like most war-simulation games. Battle of the Bulge is different in that it offers a two-player mode. Once you figure out how to beat the computer, you can challenge your friends.

Star Micronics SG-10 Printer *(See address and price above.)*

This one is actually a hint to my wife. The SG-10 is simply a lot of printer for the money. ■

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by Mark Haverstock

It's What's Up Front That Counts



For a little bit of work, you get a lot of added convenience.

The computer market is highly competitive, and computer companies frequently release upgraded versions of tried-and-true products to improve sales. Unfortunately, many improvements that users would appreciate are not viewed as essential by the manufacturer. Tandy, for example, has omitted three convenient features on the CoCo 2 and its peripherals: a pilot lamp on the front disk-drive panel and front-mounted on/off and reset switches on the CoCo itself.

If you've ever booted up your system and reached for the disk-drive switch only to find that it has been on since you last used the computer, you probably realize how advantageous a front power-indicator light would be. And although reaching behind the CoCo to press the reset or on/off switch does not involve much effort, you might also appreciate how handy it would be to have them mounted on the front of the computer.

Armed with a few parts and tools, you can add these features with a minimum of effort. The directions below are simple, but proceed with caution. Be sure your computer is unplugged before attempting any of the modifications, and keep in mind that the CoCo and its disk drives carry warranty seals. You void an existing warranty when you undertake any of these modifications.

Disk-Drive Pilot Lamp

Two disk drives for the CoCo 2, drive 0 (catalog no. 26-3029) and drive 1 (catalog no. 26-1161), each have a convenient 12-volt supply located near the back of the drive; it will light a simple LED (light-emitting diode) indicator with a 1K voltage-drop resistor in series. See Table 1 for a list of necessary tools and supplies.

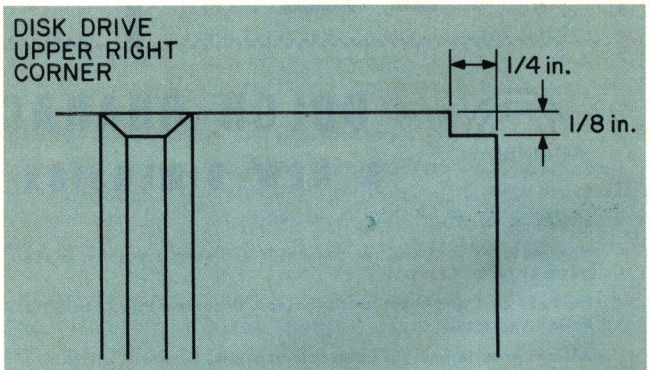


Fig. 1. Placement of the Notch for the Pilot Lamp

First, take off the metal disk-drive cover by removing the three screws at the side of each drive. (There is a warranty seal on the drive cover.) You place the indicator light in the upper right corner of the drive's front panel, thus eliminating the need to drill a hole. Using a flat file, file a small notch ⅛-inch deep and ¼-inch wide, as shown in Fig. 1. Then clean the notch, removing all dust and plastic shavings.

Next, wire the LED as shown in Fig. 2. Solder the dropping resistor to the anode lead of the LED; then solder two 8-inch wire leads to the other lead of the LED and the 1K resistor. Now solder the free leads to the power supply as shown in Photo 1, being sure to observe polarity. Attach the lead with the dropping resistor to the + 12-volt lead; attach the other to the – 12-volt lead. Check all solder connections to ensure that they are secure and do not bridge or short to other wires or board traces.

Place a drop of epoxy or Super Glue in the

System Requirements

CoCo 2
Disk Drive Optional

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Pick of the Month

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Coming Next Month



Next month brings us into 1986, and our January issue is sure to help you start the new year with a bang. Remember William S. Bonnell's "Master Your Data" article from our December 1984 issue? Many of you found it to be a great database manager. Well, you ain't seen nothin' yet.

Mr. Bonnell has made a good thing better—so much so that we thought it deserved another article. His new program incorporates many new features, some of which were suggested by our readers. We think that you will agree that this DBM is comparable in power to many commercially available programs.

Integrated software. You've all heard that term, and perhaps you are aware of integrated and semi-integrated programs for the CoCo. Next month, Scott Norman evaluates those programs head to head. Find out why software integration is such an important feature.

The next time you do 'housecleaning' with your program disks (deleting unwanted files), do yourself a favor and use Mark Goodwin's purge utility from January's *HOT CoCo*. It lets you delete multiple files simultaneously, saving much time.

How much money should you be making in five years to keep pace with inflation? J.D. Ray's inflation-tracking program next month will tell you. Use the results to convince your boss that you deserve that raise. ■

notch and lay the LED so that it is flush with the front panel of the drive. (See Photo 2.) Secure the LED in place with a piece of masking tape until the glue is dry. Finally, insulate the connections near the LED by wrapping them with pvc electrical tape, making sure that the bare leads are not exposed. Reassemble the disk case and test the pilot lamp.

Remote Reset Switch

The list of parts and tools in Table 2 gives two switches that you might use for mounting a remote reset switch on the front of your CoCo. If you want a switch that is barely visible, use part number 275-1571. If you plan to add both a reset and an on/off switch, consider part number 275-1549. It is approximately the same size as the part used for the on/off switch but is a contrasting color.

Open the computer case by removing the six screws located on the bottom of the case. (If you have not previously opened the case, the screw at the bottom left corner is covered by a warranty seal.) Turn the computer over and remove the top of the case. Decide where on the front panel you want to place the switch and mark the location. Be sure there is sufficient space under the computer top to accommodate the switch; then drill a ¼-inch mounting hole. Without mounting the switch, set the top of the case aside for the moment.

To prepare the switch, solder a 10-inch wire to each lead of the remote switch—the extra length will allow you to remove the cover easily. After locating the two tabs at the top of the computer's reset switch (see Photo 3), solder one lead from the remote switch to each of these tabs. Check your solder connections to be sure they are secure; then wrap the bottom connection of each remote switch with pvc electrical tape to insulate it and prevent contact with other components.

Finally, mount the switch on the cover, using the washer and nut provided. Place the cover loosely over the computer, plug it in, and test the reset switch before reassembling.

Parts:
- One 1K, ½-Watt Resistor (271-023)
- One Rectagular LED
- #20 or #22 Stranded Wire
- Super Glue or Epoxy
- Solder
- PVC Electrical Tape

Tools:
- Soldering Iron
- Flat, Metal File

Table 1. Parts and Tools for the Disk-Drive Pilot Light

Parts:
- Miniature SPST (Single-Pole, Single-Throw) Push-Button Switch (275-1549 or 275-1571)
- #20 or #22 Stranded Wire
- Solder
- PVC Electrical Tape

Tools:
- Drill
- ¼-inch Drill Bit
- Soldering Iron

Table 2. Parts and Tools for the Remote Reset Switch

Parts:
- SPST Push-Button On/Off Switch (275-1555)
- #20 or #22 Wire
- Solder
- PVC Electrical Tape

Tools:
- Drill
- 5/16-inch Drill Bit
- Soldering Iron

Table 3. Parts and Tools for the Remote On/Off Switch

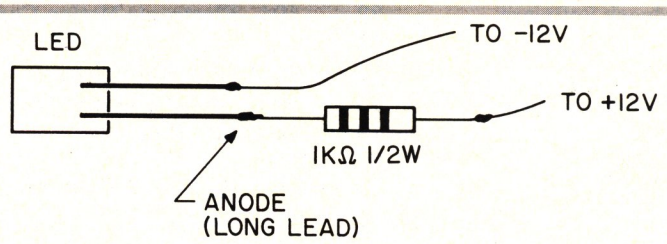


Fig. 2. Wiring the LED for the Pilot Lamp

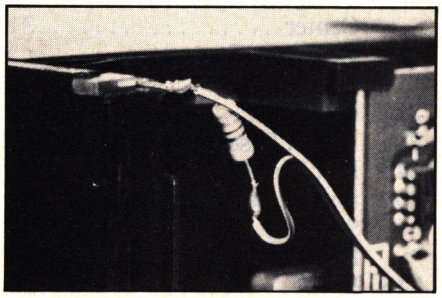


Photo 1. LED Placement for the Pilot Lamp

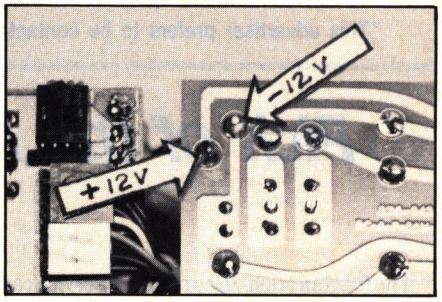


Photo 2. Power Supply for the Pilot Lamp

Remote On/Off Switch

Refer to Table 3 for a list of parts and tools needed to add a remote on/off switch. With the computer cover removed, decide upon a location for the switch, making sure there is sufficient clearance below the cover for the switch when the case is reassembled. Mark the location and drill a 5/16-inch hole. Do not mount the switch yet.

Cut two 10-inch pieces of wire and remove ¼-inch of the insulation at each end. Solder them to the two leads on the remote switch. Next, locate the two terminals pictured in Photo 4 at the rear of the computer's on/off switch. The remaining leads from the remote switch will be soldered on the right side of the middle and rear terminals. Connect the wires and solder carefully, being sure not to bridge the connections between terminals. Check all solder connections; insulate the bottom contacts of the switch by wrapping each with pvc electrical tape to prevent accidental shorting.

Finally, replace the cover, plug in the computer, and test the switch. You should be able to turn on the computer with the rear or front on/off switch. ■

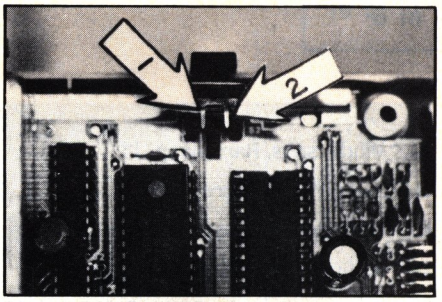


Photo 3. Two Tabs at the Top of the Computer's Reset Switch

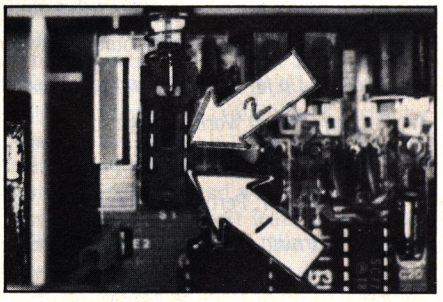
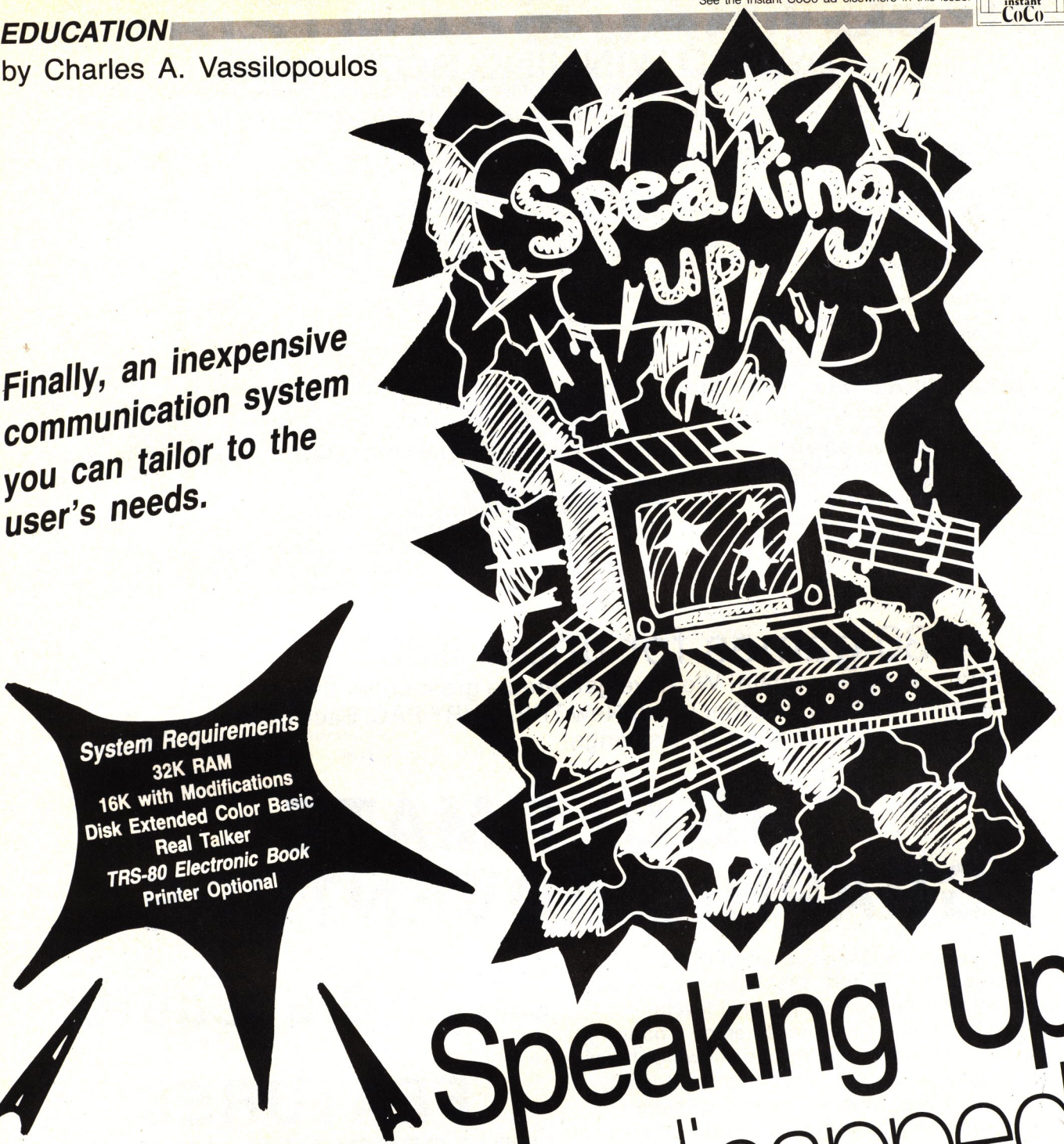


Photo 4. Two Terminals on the Rear of the Computer's On/Off Switch

Address correspondence to Mark Haverstock, 6835 Colleen Drive, Youngstown, OH 44512.

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instant CoCo

by Charles A. Vassilopoulos



Finally, an inexpensive communication system you can tailor to the user's needs.

System Requirements
32K RAM
16K with Modifications
Disk Extended Color Basic
Real Talker
TRS-80 Electronic Book
Printer Optional

Speaking Up For the Handicapped

Communication is often taken for granted. But for people who cannot speak, hometown life can be like living in a foreign country. In working with the physically handicapped mentally retarded, I frequently meet people who cannot make themselves understood because they comunicate differently from everyone else.

Alternative communication systems—ranging from sign language to picture communication boards—are available but offer limited use. With sign language and picture boards, the people with whom you wish to communicate must be looking at you or the board. It can be difficult to get their attention first. Alternative modes of communication also pose problems in the area of comprehension—they are effective only if both parties are familiar with them.

In light of the shortcomings of such communication systems, it is understandable that computer-produced speech has become popular. The cost of such equipment has frequently been a stumbling block, but systems don't need to be expensive and elaborate. You can build one using the CoCo, Real Talker from Colorware Inc., the *TRS-80 Electronic Book*, and Speech (see Listing 1). While this system is not portable, it is suitable for use in the home and for experimentation. The CoCo is a good choice because it is moderately priced and has many ports for external devices. For this application, only one such device is used.

Illustration by Emmanuelle Becker

continued

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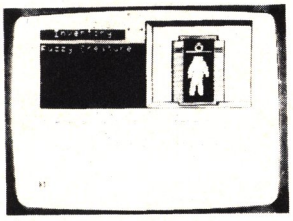
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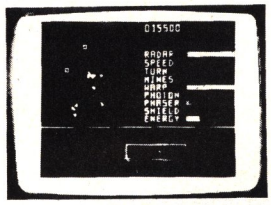
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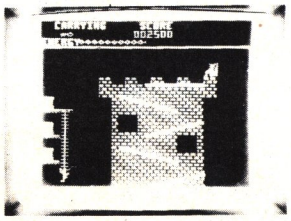
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continued from p. 51

Phoneme	Example	Hex	Dec	Duration
A2	made	05	5	71
A1	made	06	6	103
A	day	20	32	185
AY	day	21	33	65
AE	dad	2E	46	185
AE1	after	2F	47	103
AH1	father	15	21	146
AW	call	3D	61	250
AW2	salty	30	48	90
AW1	lawful	13	19	146
Complex Sounds: A1-AY-Y as in fate and maid Hex = 06-21-29 Dec = 6-33-41				
Y	any	29	41	103
E1	be	3C	60	121
E	meet	2C	44	185
EH3	jacket	00	0	59
EH2	enlist	01	1	71
EH1	heavy	02	2	121
EH	get	3B	59	185
ER	bird	3A	58	146
Complex Sounds: AY-I1 as in fear and beer HEX = 21-0B DEC = 33-11				
I3	inhibit	09	9	55
I2	inhibit	0A	10	80
I1	inhibit	0B	11	121
I	pin	27	39	185
Complex Sounds: AH1-EH3-Y as in find and wide Hex = 15-0-29 Dec = 21-0-41				
UH3-AH2-Y as in fight and white HEX = 23-08-29 DEC = 35-8-41				
AH1-I3-UH3-L as in file and smile HEX = 15-09-23-18 DEC = 21-9-35-24				
02	for	34	52	80
01	aboard	35	53	121
0	cold	26	38	185
AH2	honest	08	8	71
AH	mop	24	36	250
Complex Sounds: 01-U1 as in float and note Hex = 35-37 Dec = 53-55				
IU	you	36	54	59
U1	you	37	55	90
UH3	mission	23	35	47
UH2	about	31	49	71
UH1	uncle	32	50	103
UH	cup	33	51	185
Complex Sounds: Y1-IU-U1 as in few, you, and music Hex = 22-36-37 Dec = 34-54-55				

Table 1. Phonemes Categorized by Sound: Vowels

Creating Messages

Although you could create a communication system using only Real Talker and the CoCo, the addition of the *Electronic Book* and Speech provides versatility. With them you can more easily accommodate users with limited motor control; you can also tailor the computer's speech patterns to make them sound more natural.

The first step in customizing a communication system is to produce phonemic representations of the messages. (A phoneme is a significant unit of speech that serves to distinguish one utterance from another.) While Real Talker's software allows you to produce speech from written messages within a Basic program, the conversion is not always accurate. Moreover, obtaining different pitches, which can increase the intelligibility of speech, is difficult.

To obtain a phonemic representation of a message, load Real Talker's software (Realtalk) from cassette and execute it according to directions provided with the program. After you type CLOAD "Textphon", run the program and press the enter key. You can then write and edit your own messages. The instructions in Real Talker's documentation are clear, but there are a few tips that might make your work easier.

First, delete all pauses (PA0). As a general rule, they do not affect the intelligibility of messages and deleting them often makes computerized speech sound more human. If messages are long, some pauses are necessary but should be chosen judiciously. There are exceptions. Multiple-sentence messages should contain pauses between sentences. Certain sounds, such as an H at the beginning of a word, will not sound correct without a pause or something between them and the preceding phoneme.

If a sound seems wrong, it is usually because the way we hear individual speech sounds depends upon the sound that precedes and follows it. A fact of speech perception is that silence (an absence of sound) can be perceived as a phoneme if the length of silence between certain phonemes is of a particular duration.

If certain words are not quite right even though the phonemic sound is correct, try a similar phoneme with a shorter or longer duration. Sometimes pauses are needed in the middle of words in order to perceive a specific sound. Other phonemes, such as CH and J, require sounds before them in order to sound correct. (Real Talker's sheet of sounds and their decimal and hexadecimal numbers indicate that J must be preceded by T and CH must be preceded by D in order to produce the correct sound. Actually it is reversed: J must be preceded by D and CH by T.)

You can also change inflection. As Real Talker's documentation points out, pitch can be added to a phoneme by adding the appropriate number to it. In Textphon this is represented with a period, exclamation point, or up arrow. When you use pitch to produce inflection, lowering the pitch produces the sound of emphasis on a syllable. Changing pitch can produce many different results. In general, if you want to change pitch level, change the pitch of an entire word or syllable. Dictionaries are a good resource for breaking words into syllables and placing emphasis. Sometimes certain sounds are perceived with emphasis and thus require a pitch change in order to perceive the emphasis correctly. Generally, however, the sounds are fine as they are; trying to get a computer to sound exactly like you can be wasteful.

It is important that every message end in a stop (STP). Use the DATA number 255 to tell the program that a message has ended and that the next memory location is the beginning of another message.

A printer can be useful because, once you have finished editing a message, Textphon outputs the numbers for each phoneme, including the correct number if you changed the pitch. When you store phonemes on tape or disk, the numbers stored do not include the pitch. However, if you are copying the phonemes or their numeric values from the

Phoneme	Example	Hex	Dec	Duration
Sound 00:				
001	looking	16	22	103
00	book	17	23	185
U	move	28	40	185
Sounds: OI, OY, and OIL:				
01-UH3-Y	*foy boy*	Hex = 35-23-29		
		Dec = 53-35-41		
01-13-UH3-L	*foil spoil*			
		Hex = 35-09-23-18		
		Dec = 53-9-35-24		
Sound OW:				
AH1-02-U1	*found cow*			
		Hex = 15-34-37		
		Dec = 21-52-55		
UH3-AH2-U1	*foust house*			
		Hex = 23;08-37		
		Dec = 35-8-55		

Table 2. Phonemes Categorized by Sound: Vowel Dipthongs

screen and want to include the pitch changes, add 64 for pitch 1, 128 for pitch 2, and 196 for pitch 3. If there is no pitch marker following a phoneme, the sounds you hear using Textphon are at the first pitch level. Tables 1, 2, and 3 list all sounds—vowels, dipthongs, and consonants—with their numeric representation in hexadecimal and decimal and their duration. Textphon uses only decimal numbers.

The Program

Speech (Listing 1) allows you to link spoken messages with the 12 numbered, touch-sensitive rectangles of the *Electronic Book*. It contains five parts. The first (lines 30-40) POKEs the sound numbers stored in the DATA statements (lines 50-61) to a section of RAM (random-access memory). Lines 75-86 contain the written messages that will appear on the screen when a notebook number is pressed. You can leave them out; they were written into the program to document the program and ensure that it ran properly. Sometimes speech output will get people's attention, but they might not understand what was said. In such instances a written message can be of assistance. Lines 200-220 read the electronic keyboard and convert the number read from the right joystick port into a memory location that denotes the beginning of the speech message. The fifth part (lines 240–270) PEEKs each successive memory location and sends the number to the speech synthesizer to produce the speech sound.

Before typing in Speech, plug the *Electronic Book* into the right joystick port and test it with the following program:

```
10 IF JOYSTK(0)=0 AND JOYSTK(1)=0 THEN 10 ELSE PRINT
   JOYSTK(0), JOYSTK(1):GOTO10
```

Press each number in the notebook and write down the numbers printed on the screen for each one. Sometimes there are discrepancies; different numbers might also appear when you use different computers. Do not be alarmed to find that each notebook number produces a variety of joystick numbers. Generally, they fall within a certain range and will not overlap. And usually one number appears more often than others. However, it is wise to test the notebook at Radio Shack to make sure that a number shows up no matter where

Phoneme	Example	Hex	Dec	Duration
B	*bag*	0E	14	71
K (C)	*trick*	19	25	80
CH	*chip*	10	16	71
Note: T (Hex = 2A; Dec = 42) must precede CH in order to get the CH sound. Thus CH is T-CH (Hex = 2A-10; Dec = 42-16).				
D	*paid*	1E	30	55
F	*fast*	1D	29	103
G	*get*	1C	28	71
H	*hello*	1B	27	71
J	*judge*	1A	26	47
Note: D (Hex = 1E, Dec = 30) must precede J in order to get the J sound. Thus J is D-J (Hex = 1E-1A; Dec = 30-26).				
K	above, same sound as a C.			
L	*land*	18	24	103
M	*mat*	0C	12	103
N	*sun*	0D	13	80
NG	*thing*	14	20	121
P	*past*	25	37	103
K-W (Q)	as in *quest*	Hex = 19-2D		
		Dec = 25-45		
R	*red*	2B	43	90
ER	*bird*	3A	58	146
S	*pass*	1F	31	90
SH	*shop*	11	17	121
T	*tap*	2A	42	71
DT	*butter*	04	4	47
TH	*thin*	39	57	71
THV	*the*	38	56	80
V	*van*	0F	15	71
W	*win*	2D	45	80
Z	*zoo*	12	18	71
ZH	*azure*	07	7	90

Table 3. Phonemes Categorized by Sound: Consonants

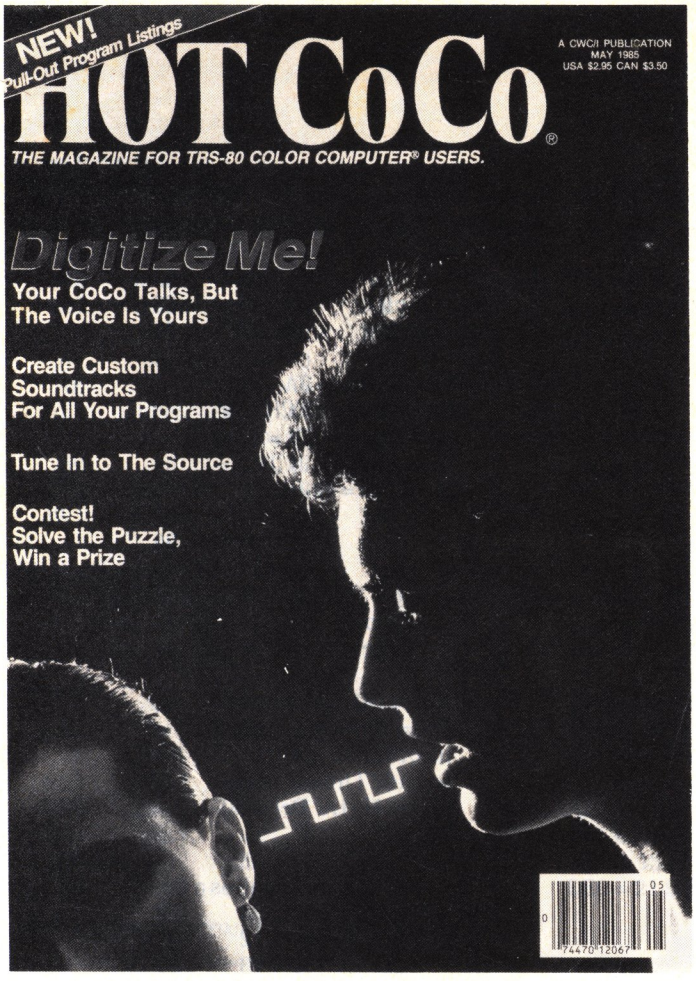
you press the rectangle. In some cases, I have put a range of numbers in the IF. . .THEN statements, using the format below:

```
214 IF AZ>=48 AND AZ<=52 THEN MZ=11:GOTO230
```

This makes the rectangle more touch sensitive, but it also increases the possibility of the wrong message being output when you run the program.

Since the phonemes corresponding to your messages are stored in DATA statements that are later transferred to specific memory locations, you must set aside space in memory. Line 5 of the program performs this task. As written, line 5 reserves memory locations

continued



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continued from p. 55

28342 to 32767 in a 32 or 64K CoCo. If you have a 16K CoCo change lines 5 and 30 to read:

```
5  CLEAR 500, 14383
30  N = 14384:MZ = 1:M(1) = 14384
```

This leaves a large amount of space for the message phonemes.

Table 4 correlates the DATA lines for a message with a number in the *Electronic Book*. When you type in the program, each DATA statement should have the decimal number of your phonemes; be sure to include 255 as a stop.

Improving the System

By creating a notebook overlay consisting of pictures, words, or symbols corresponding to each message, you can make communication more effective. BLISS symbols, like those depicted in Fig. 1, are especially useful because they encourage the developmentally disabled to use symbols rather than relying on pictures or objects to communicate abstract ideas.

You need not limit the system to 12 messages. If you want to include more, you can add pages and use one or more numbers in the notebook as page-changers, perhaps making 12 the number for paging backward and 11 the number for paging forward. If each page were colored differently, the color on the television screen could denote the page of the message being used. Of course, such a system would require that the user be able to turn the pages of the book. It would also require more memory and storage of the messages in a two-dimensional array. One dimension would specify the set of messages being accessed; the other would specify the particular message.

Line Number	Data Statement	JOYSTK(0)	JOYSTK(1)	EB Number	Message Number
202	50	0	6	10	1
203	51	0	17–19	11	2
204	52	0	28–30	12	3
205	53	0	63	7	4
206	54	0	49–52	8	5
207	55	0	40–41	9	6
210	56	6	0	4	7
211	57	15–18	0	5	8
212	58	29	0	6	9
213	59	60–63	0	1	10
214	60	48–52	0	2	11
215	61	38–42	0	3	12

Table 4. Relationship of IF. . .THEN Line Numbers, DATA statements, Joystick, and Electronic Book*(EB)*

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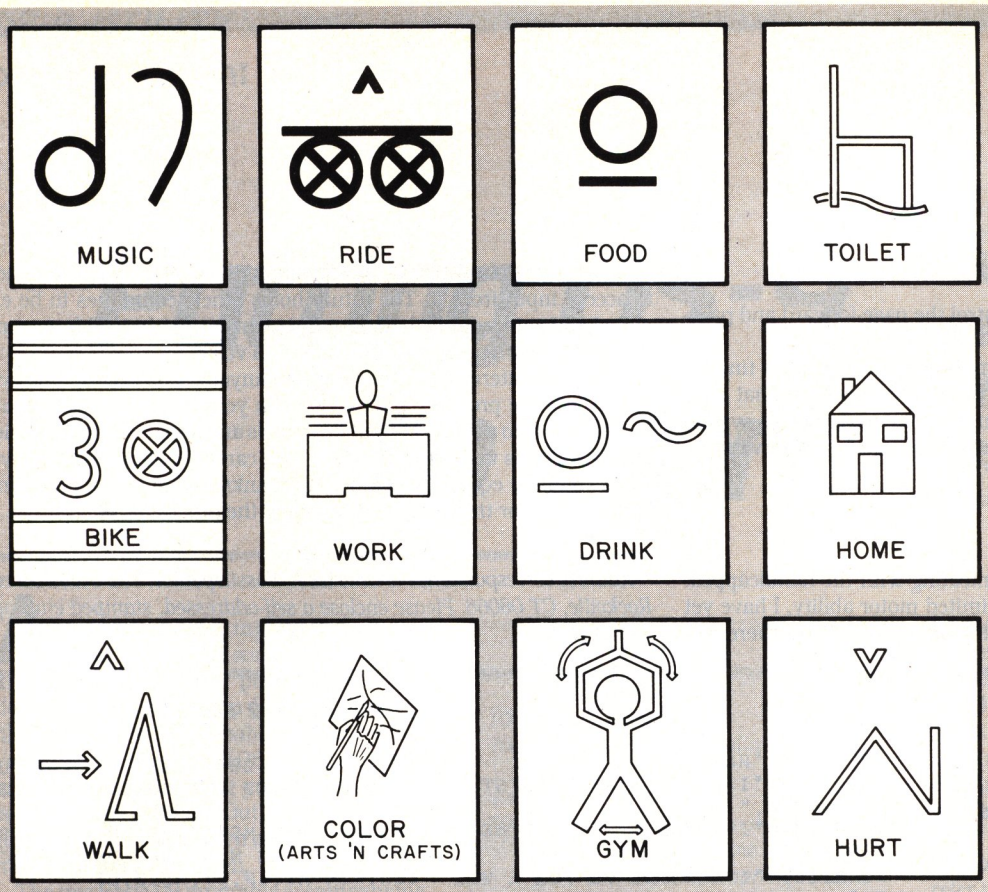


Fig. 1. BLISS and Picture Symbols Overlay

Listing 2 contains the shell of the program for multiple pages. The two-dimensional array is established in line 20. Lines 20, 32, and 203 contain lowercase p's; substitute a number corresponding to the number of pages in your system. (There are two occurrences in line 20.) The program assumes you will put 10 messages on each page (the other numbers are used for paging); therefore you must supply enough data for each page or you will receive an out-of-data message.

Lines 30-50 ensure that the message phonemes are properly stored. Place DATA statements containing your message phonemes between lines 45 and 199. If you want the messages to appear on the screen, include the following statement on the line before the printed message:

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P = 1:CLS P:PRINT "READY"

(see Listing 1). Lines 203 and 204 control the page-forward and page-backward features, respectively.

Listing 2 lets you create up to 80 messages (10 messages times 8 different colors). You could group pictures by category so that messages that are similar in content are on the same page. Such a system might require 64K because you must change line 5 to reserve more memory for your messages.

The Future

Many possibilities exist for communicating with the handicapped. Although some of the disabled have limited motor ability, I have yet to find anyone who cannot respond in some way. Where there is a response there is a switch to take advantage of it and a computer ready to accept input from it. The future holds other techniques to be explored and enjoyed; much of the enjoyment can be derived from communicating with those who do not have a voice.

I would be interested in hearing from anyone who sets up this system. There are probably professionals in your local area who would also be happy to assist you—public schools and social-service agencies are good places to start. Any advice you can offer on alternative systems would be equally welcome. My thanks to Joe McLaughlin and Linda Stefon for their help in developing the programs. ■

Address correspondence to Charles A. Vassilopoulos, 152 Union Street, Rockville, CT 06066. Please enclose a self-addressed, stamped envelope for his reply.

Program Listing 1. Speech

```
5 CLEAR 33Ø,28341
2Ø DIM M$(12),M(12)
25 CLS:PRINT"INPUTTING CODES"
3Ø N=28342:MZ=1:M(1)=28342
35 READ A:POKEN,A
37 IF A<>255 THEN 4Ø
38 IF MZ+1>12 THEN 65
39 MZ=MZ+1:M(MZ)=N+1
4Ø N=N+1:GOTO35
5Ø DATA 85,64,97,67,45,21,13,42,
126,1Ø6,118,1Ø4,126,88,1Ø3,95,12
3,77,67,1Ø6,118,1Ø4,67,12,34,54,
4Ø,82,1Ø3,89,126,67,67,67,255
51 DATA85,64,97,1Ø9,87,94,67,24,
21,41,25,1Ø6,118,1Ø4,67,43,21,41
,3Ø,126,76,85,64,97,67,14,21,6Ø,
25,126,67,67,67,255
52 DATA85,64,97,1Ø9,85,77,1Ø6,1Ø
6,118,1Ø4,92,1Ø2,119,67,93,1Ø2,1
Ø7,67,115,67,1Ø9,125,89,126,67,6
7,67,255
53 DATA85,64,97,45,23,3Ø,88,85,1
24,89,1Ø6,118,1Ø4,92,1Ø2,119,29,
38,43,51,1Ø7,85,1Ø5,94,67,39,13,
56,51,89,1ØØ,1Ø7,126,67,67,67,25
5
54 DATA1Ø3,1Ø6,95,1Ø6,85,124,76,
67,42,54,4Ø,94,118,1Ø4,67,31,51,
12,67,1Ø9,122,89,67,67,255
55 DATA85,64,97,45,23,3Ø,88,85,1
24,89,42,54,4Ø,67,89,115,88,122,
126,67,67,67,255
56 DATA85,64,97,45,21,13,42,31,5
1,12,93,99,119,119,94,126,67,67,
67,255
57 DATA85,64,97,45,23,3Ø,88,85,1
24,89,67,95,115,76,121,1Ø5,84,67
,42,54,4Ø,67,9Ø,1Ø7,1Ø8,77,89,12
6,67,67,67,255
58 DATA39,42,31,1Ø6,85,124,76,42
,54,4Ø,92,1Ø2,119,67,42,54,4Ø,56
,51,94,9Ø,1Ø3,76,126,67,67,67,25
5
59 DATA21,Ø,33,77,1Ø8,94,42,54,4
Ø,98,118,1Ø4,82,67,56,51,1Ø6,87,
97,88,64,1Ø6,126,67,67,67,255
6Ø DATA21,Ø,33,1Ø9,85,77,1Ø6,67,
42,54,4Ø,28,38,55,91,1Ø2,119,76,
126,67,67,67,255
61 DATA21,Ø,33,46,12,126,91,122,
1Ø7,1Ø6,126,67,67,67,255
65 CLS
7Ø PRINT "READY"
75 M$(1)="I WOULD LIKE TO LISTEN
 TO MUSIC."
76 M$(2)="I WOULD LIKE TO RIDE M
Y BIKE."
77 M$(3)="I WANT TO GO FOR A WAL
K."
78 M$(4)="I WANT TO GO FOR A RID
E IN THE  CAR."
79 M$(5)="IT'S TIME TO DO SOME W
ORK."
8Ø M$(6)="I WOULD LIKE TO COLOR.
"
81 M$(7)="I WANT SOME FOOD."
82 M$(8)="I WOULD LIKE SOMETHING
 TO DRINK."
83 M$(9)="IT'S TIME TO GO TO THE
 GYM."
84 M$(1Ø)="I NEED TO USE THE TOI
LET."
85 M$(11)="I WANT TO GO HOME."
86 M$(12)="I AM HURT."
2ØØ AZ=JOYSTK(Ø):AX=JOYSTK(1):IF
 AX=Ø AND AZ=Ø THEN 2ØØ
2Ø1 IF AX=Ø THEN 21Ø
2Ø2 IF AX=6 THEN MZ=1:GOTO24Ø
2Ø3 IF AX>=17 AND AX<=19 THEN MZ
=2:GOTO24Ø
2Ø4 IF AX>=28 AND AX<=3Ø THEN MZ
=3:GOTO24Ø
2Ø5 IF AX=63 THEN MZ=4:GOTO24Ø
2Ø6 IF AX=>49 AND AX<=52 THEN MZ
=5:GOTO24Ø
2Ø7 IF AX=41 OR AX=4Ø THEN MZ=6:
GOTO24Ø
21Ø IF AZ=6 THEN MZ=7:GOTO24Ø
211 IF AZ=>15 AND AZ<=18 THEN MZ
=8:GOTO24Ø
212 IF AZ=29 THEN MZ=9:GOTO24Ø
213 IF AZ=>6Ø AND AZ<=63 THEN MZ
=1Ø:GOTO24Ø
214 IF AZ=>48 AND AZ<=52 THEN MZ
=11:GOTO24Ø
215 IF AZ=>38 AND AZ<=42 THEN MZ
=12:GOTO24Ø
22Ø GOTO2ØØ
24Ø N=M(MZ):POKE65281,18Ø:POKE65
283,61:POKE65315,63
245 PRINT:PRINTM$(MZ):PRINT
25Ø S=PEEK(N):POKE6541Ø,S
26Ø IF S=255 THEN 2ØØ
27Ø N=N+1:GOTO25Ø
```

Program Listing 2. Eighty

```
5 CLEAR 33Ø,28341:REM THIS SHOUL
D BE ADJUSTED FOR MORE MEMORY SP
ACE
2Ø REM OMIT M$(1Ø,p) IF YOU ARE
NOT PRINTING MESSAGES ON THE SCR
EEN:DIM M$(1Ø,p),M(1Ø,p)
25 CLS:PRINT"INPUTTING CODES"
3Ø N=28342:MZ=1:M(1)=28342
32 FOR I=1 TO p
33 IF I=1 THEN 35
34 N=N+1:M(1,I)=N
35 READ A:POKEN,A
37 IF A=255 THEN 4Ø
38 IF MZ+1>1Ø THEN 45
39 MZ=MZ+1:M(MZ,I)=N+1
4Ø N=N+1:GOTO35
45 MZ=1:NEXT I:GOTO199
199 P=1:CLS P:PRINT "READY"
2ØØ AZ=JOYSTK(Ø):AX=JOYSTK(1):IF
 AX=Ø AND AZ=Ø THEN 2ØØ
2Ø1 IF AX=Ø THEN 21Ø
2Ø2 IF AX=6 THEN MZ=1:GOTO24Ø
2Ø3 IF AX>=17 AND AX<=19 THEN P=
P+1:IF P>p THEN P=1:CLS P:GOTO2Ø
Ø ELSE CLS P:GOTO 2ØØ
2Ø4 IF AX>=28 AND AX<=3Ø THEN P=
P-1:IF P<Ø THEN P=p:CLS P:GOTO 2
ØØ ELSE CLS P:GOTO 2ØØ
2Ø5 IF AX=63 THEN MZ=2:GOTO24Ø
2Ø6 IF AX=>49 AND AX<=52 THEN MZ
=3:GOTO24Ø
2Ø7 IF AX=41 OR AX=4Ø THEN MZ=4:
GOTO24Ø
21Ø IF AZ=6 THEN MZ=5:GOTO24Ø
211 IF AZ=>15 AND AZ<=18 THEN MZ
=6:GOTO24Ø
212 IF AZ=29 THEN MZ=7:GOTO24Ø
213 IF AZ=>6Ø AND AZ<=63 THEN MZ
=8:GOTO24Ø
214 IF AZ=>48 AND AZ<=52 THEN MZ
=9:GOTO24Ø
215 IF AZ=>38 AND AZ<=42 THEN MZ
=1Ø:GOTO24Ø
22Ø GOTO2ØØ
24Ø N=M(MZ,P):POKE65281,18Ø:POKE
65283,61:POKE65315,63
245 REM OMIT IF NOT USING WRITTE
N MESSAGES ON THE SCREEN:PRINT:P
RINT M$(MZ,P):PRINT
25Ø S=PEEK(N):POKE6541Ø,S
26Ø IF S=255 THEN 2ØØ
27Ø N=N+1:GOTO25Ø
```

by Mike Knight

Putting OS-9 to Work

Add directory and mailing-list software to your library of Basic-09 programs.

As the new operating system on the block, OS-9 is still something of an unknown quantity. Many people who buy it don't know what they can do with it. If you're like me, you were probably amazed when you looked at the price of OS-9 software. Buying Basic-09 and writing your own software is an obvious solution. But unless you have time to sit down and learn another Basic, it's hard to accomplish much.

The two Basic-09 programs accompanying this article, Copy1 (Listing 1) and Address (Listing 2), might help you get started. Copy1 lets you copy an OS-9 directory to another directory—an important feature that Microware omitted when they created the system. Address is a mailing-list database that stores, sorts, retrieves, modifies, and prints addresses. You can print the entire file or only the addresses that satisfy particular search criteria.

Copy1

Copy1 and the RUNB and COPY #16K commands use all available memory; before running Copy1, unlink any programs that you have loaded into memory. Because OS-9 accepts data typed in upper- or lowercase, you can use uppercase or both upper- and lowercase when you type in Copy1. If you make a mistake, press the break key and start again. (Pressing the break key is also a quick way to exit the program.)

When the program prompts you for the inpath and outpath, enter the directories from which you will be working. Respond to the disk-swapping prompt with a Y only if you have one disk drive. If you elect to use all files, the program shows you the files as they are copied. Otherwise, the program asks whether or not to copy each file.

Program flow is easy to follow. If you are new to Basic-09, follow the REPEAT. . . UNTIL and WHILE. . .DO. . .ENDWHILE statements. They are a programmer's dream come true! Copy1 contains a number of error-checking routines; you can delete some of them to conserve RAM. Do not, however, delete the error-handling routines numbered 214 and 218—they are essential to the program's operation.

Line	Description
1	Main Menu
100–150	I/O Routines
200–245	File-Control Routines
300	Sort Routine
400–420	Print Routines
500–511	Record I/O Subroutines
520	Screen Subroutine
530	Sort-Record Swapping Routine
700	End of Program
800–810	Error-Handling Routines

Table 1. Address Program Structure

On my system, Copy1 runs fine with COPY #16K in the SHELL command (shortly after line 3). After you have typed in the program, save and pack it. Exit Basic-09 and run the packed version. If you get error message 207 (memory full) from OS-9 when the program attempts to copy a file, go back to the Basic-09 text editor and change #16K to #14K or less. Resave and pack the program and try again.

Address

Basic-09 commands, such as BOOLEAN, TYPE, ON ERROR. . .GOTO, SEEK, SHELL, SUBSTR, and ENDIF, will look strange to programmers accustomed to Disk Extended Color Basic. If you are unfamiliar with these statements, read chapters 7, 8, 9, and 10 in the Basic-09 reference manual; if you've never used the text editor, read chapter 4 before typing in the program.

Type MEM 8000 from Basic-09 before typing in the program so that there will be sufficient space in memory for the entire program. Repeat this procedure when you load Address into Basic-09; otherwise you will receive error messages.

System Requirements

64K RAM
OS-9
Basic-09
Disk Drive

Address is a modular program; the beginning lines for modules are 1, 100, 200, and so on. (Refer to Table 1 for an outline of program structure.) The variable names are self-explanatory. Line numbers are not necessary in Basic-09; in fact, they slow the program down. I therefore tried to keep line numbers to a minimum, using them only to refer to different routines.

Address's sort is as fast as many commercial mailing-list sorts running in Disk Extended Color Basic. But because space in memory is limited, the program uses a disk sort, which is still relatively slow. If you have more than one disk drive, use a freshly formatted disk for the data file to speed sorting.

The text version of Address takes up 5,044 bytes. By packing the program, you can reduce it to 4,347 bytes. Be sure that you have thoroughly debugged the program before packing it.

Running Address

Since Address is menu driven, most options are easy to understand. There are, however a few items that require elaboration. You can open, close, create, delete, and get a file directory from the I/O menu. The file-control menu, from which you will do most of your work, offers different choices. When you select View/Change, four prompts—F, B, C, and <Enter>—appear at the bottom of the screen. Press F (forward) to display the next record and B (back) to display the previous one. Pressing C lets you change any field of the record shown on the screen. When you press the enter key, you return to the menu for file control.

The second option in the Print menu, Substring, searches the name and zip-code fields for a specific string. If, for example, you enter Smith, the program prints all addresses containing Smith. By entering an individual's name you can search for a certain address and print it out. The program prompts you for the tab and spacing.

If you make a mistake, press the break key;

the files remain open and the program returns you to the main menu. Address automatically returns you to the main menu whenever you make an error that is not fatal to program operation; all files will be closed. The most common error is 216, "path name not found." To avoid this error, enter the entire path name in response to the path prompt:

/D1/DATA.FILES/addr.file

Once you become familiar with the program, it is unlikely that you will make errors.

The Last Word

Any program can benefit from modifications that tailor functions to an individual's needs. Limited memory imposes the greatest constraint on adapting these two programs. Adding more functions to Copy1, for example, would mean less memory for the COPY command and more disk swaps for users with one disk drive. It's a tradeoff. Perhaps someone with a 128K (or higher) upgrade can devise a patch to OS-9 that will permit additional features without sacrificing ease of use.

Although Copy1 and Address are both error-trapped, it is possible that you will encounter an unforseen error. I welcome comments and questions regarding the programs. Please enclose a copy of the listing and a self-addressed, stamped envelope for my reply.■

For a copy of Address, send $5 and a blank disk to Mike Knight, P.O. Box 128, Wallowa, OR 97885.

Program Listing 1. Copy 1

```
PROCEDURE copy1

(* Copy1 ver. 1.01 *)
(* Michael Knight *)
(* PO Box 128, Wallowa, OR 97885 *)
(* (C) 1984 *)

DIM diskpath,a,s,d:INTEGER
DIM inpath,outpath,filename:STRING
DIM dirline:STRING[80]; allfile,copyfile,ok:BOOLEAN
DIM response:STRING[1]; swap:STRING[3]


1 ON ERROR GOTO 6

ok:=FALSE

PRINT CHR$(12);
PRINT "** Copy1 **"
PRINT

PRINT "Do you want to"
PRINT
INPUT "  See a directory? ",response
IF response="y" OR response="Y" THEN
INPUT "  Path: ",outpath
SHELL "dir "+outpath
ENDIF

INPUT "  Make a directory? ",response
IF response="y" OR response="Y" THEN
INPUT "  Path: ",outpath
SHELL "makdir "+outpath
ENDIF

PRINT
INPUT "Inpath: ",inpath
INPUT "Outpath: ",outpath

INPUT "Will you need to swap disks? ",response
IF response="Y" OR response="y" THEN
swap:=" -s"
ELSE
swap:=""
ENDIF
```


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```
INPUT "Use all files? ",response
allfile:=response="Y" OR response="y"
IF allfile THEN
SHELL "tmode .1 -pause"
ENDIF

PRINT CHR$(12);
PRINT "Making a directory file for"
PRINT inpath; "."
ok:=TRUE
2 SHELL "dir "+inpath+" > /d0/copy1_dir"
PRINT
ok:=FALSE

inpath:=inpath+"/"
outpath:=outpath+"/"

OPEN #diskpath,"/d0/copy1_dir":READ
READ #diskpath,dirline

WHILE NOT(EOF(#diskpath)) DO
READ #diskpath,dirline
a:=LEN(TRIM$(dirline))
IF a>0 THEN
s:=1
REPEAT
d:=s
WHILE s<=a AND MID$(dirline,s,1)<>" " DO
s:=s+1
ENDWHILE
filename:=MID$(dirline,d,s-d)
IF NOT(allfile) THEN
PRINT "Use "; filename;
INPUT response
copyfile:=response="Y" OR response="y"
ENDIF

3 IF allfile OR copyfile THEN
IF allfile THEN
PRINT filename; " being copied."
ENDIF
SHELL "copy #16K "+inpath+filename+" "+outpath+filename+swap

IF swap<>"" THEN
INPUT "Insert SOURCE, press ENTER. ",response
ENDIF
ENDIF

4 WHILE s<a AND MID$(dirline,s,1)=" " DO
s:=s+1
ENDWHILE

UNTIL s>=a
ENDIF
ENDWHILE
PRINT


5 INPUT " Another ?  ",response
IF response<>"Y" AND response<>"y" THEN
IF allfile THEN
SHELL "tmode .1 pause"
```


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```
ENDIF
END
ENDIF
GOTO 1


6 errnum:=ERR

IF errnum=2 THEN
PRINT "ABORT!!"
INPUT "Are you sure? ",response
IF response<>"Y" AND response<>"y" THEN
GOTO 1
ENDIF
END
ENDIF

IF errnum=207 THEN
PRINT "Memory full - Process aborted!"
END
ENDIF

IF errnum=214 THEN
IF NOT(allfile) THEN
PRINT filename; " is a directory!"
ENDIF
GOTO 4
ENDIF

IF errnum=215 OR errnum=216 THEN
PRINT "Pathname not found."
GOTO 5
ENDIF

IF errnum=218 THEN
IF NOT(ok) THEN
PRINT outpath+filename
INPUT "alredy exists: Rewrite?",response
IF response="Y" OR response="y" THEN
SHELL "del "+outpath+filename
IF swap<>"" THEN
INPUT "Insert SOURCE, press enter. ",response
ENDIF
GOTO 3
ELSE
GOTO 4
ENDIF
ENDIF
SHELL "del /d0/copy1_dir"
GOTO 2
ENDIF

IF errnum=242 THEN
PRINT LEFT$(outpath,3); " is write protected."
GOTO 5
ENDIF

IF errnum=248 THEN
PRINT "Disk full."
GOTO 5
ENDIF

PRINT "OS-9 error #"; errnum
GOTO 5
```

Program Listing 2. Address

```
PROCEDURE address

(* address v1.1 *)
(* Michael Knight
(* PO Box 128
(* Wallowa, OR 97885
(* (C) February 1985

(* initialize data storage *)
DIM response:STRING[1]
DIM select,diskpath,printpath:BYTE
DIM path,dirpath,delpath,search:STRING[20]
```


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```
DIM temp,count,recnum1,recnum2,errnum,tb,xx,yy,sp:
INTEGER
DIM fopen,all,prphone:BOOLEAN
TYPE addrdata=name,address:STRING[25]; city,stat,zip,
phone:STRING

[15]
DIM adr1,adr2,adr3:addrdata

fopen:=FALSE

1 PRINT CHR$(12);

(* set up error checking *)
ON ERROR GOTO 800

PRINT " ** MAIN MENU **"
PRINT
PRINT " 1) I/O"
PRINT " 2) File Control"
PRINT " 3) Sort"
PRINT " 4) Print"
PRINT " 5) Terminate"
PRINT
INPUT " (1,2,3,4,5) ",select
IF select<1 OR select>5 THEN
GOTO 1
ENDIF
ON select GOTO 100,200,300,400,700

100 PRINT CHR$(12);
PRINT " **  I/O  **"
PRINT
PRINT " 1) Open File"
PRINT " 2) Close File"
PRINT " 3) Create"
PRINT " 4) Directory"
PRINT " 5) Delete file"
PRINT " 6) Return"
PRINT
INPUT " (1,2,3,4,5,6) ",select
IF select<1 OR select>6 THEN
GOTO 100
ENDIF
ON select GOTO 110,120,130,140,150,1

110 IF fopen THEN
GOTO 100
ENDIF
INPUT "Path: ",path
IF path="" THEN
GOTO 100
ENDIF
OPEN #diskpath,path:UPDATE
filesize:=0
(* get # of records in file *)
WHILE NOT(EOF(#diskpath)) DO
filesize:=filesize+1
SEEK #diskpath,(filesize-1)*SIZE(adr1)
ENDWHILE
filesize:=filesize-1
IF filesize<=0 THEN
filesize:=0
ENDIF
fopen:=TRUE
PRINT path; " is now open."
PRINT "File size: "; filesize
FOR count=1 TO 5000
NEXT count
GOTO 100

120 IF NOT(fopen) THEN
GOTO 100
ENDIF
CLOSE #diskpath
fopen:=FALSE
PRINT path; " is closed."
path:=""
FOR count=1 TO 5000
NEXT count
GOTO 100
```


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```
130 IF fopen THEN
GOTO 100
ENDIF
INPUT "Path : ",path
IF path="" THEN
GOTO 100
ENDIF
CREATE #diskpath,path:UPDATE
filesize:=0
fopen:=TRUE
PRINT path; " is now open."
FOR count=1 TO 5000
NEXT count
GOTO 100

140 INPUT "Dirpath : ",dirpath
IF dirpath="" THEN
GOTO 100
ENDIF
SHELL "dir "+dirpath
INPUT "Press <enter> ",response
GOTO 100

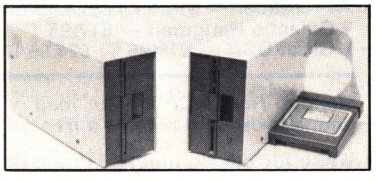
150 INPUT "Delpath : ",delpath
IF delpath=path THEN
PRINT path; " is open!"
FOR count=1 TO 6000
NEXT count
GOTO 100
ENDIF
IF delpath="" THEN
GOTO 100

ELSE
PRINT "Delete "; delpath; ":"
INPUT "Are you sure? ",response
IF response<>"Y" AND response<>"y" THEN
GOTO 100
ENDIF
DELETE delpath
PRINT delpath; " has been deleted."
FOR count=1 TO 5000
NEXT count
ENDIF
GOTO 100

200 IF NOT(fopen) THEN
GOTO 1
ENDIF
PRINT CHR$(12);
PRINT " ** File Control **"
PRINT
PRINT " 1) Input"
PRINT " 2) View/Change"
PRINT " 3) Return"
PRINT
INPUT " (1,2,3) ? ",select
IF select<1 OR select>3 THEN
GOTO 200
ENDIF
ON select GOTO 210,220,1

210 PRINT CHR$(12);
PRINT " ** INPUT **"
PRINT
PRINT "Record #"; filesize+1
PRINT
INPUT "Name : ",adr1.name
INPUT "Addr : ",adr1.address
INPUT "City : ",adr1.city
INPUT "State: ",adr1.stat
INPUT "Zip  : ",adr1.zip
INPUT "Phone: ",adr1.phone
filesize:=filesize+1
recnum1:=filesize
GOSUB 510
GOTO 200

220 PRINT CHR$(12);
IF filesize<=0 THEN
GOTO 200
ENDIF
PRINT " ** View **"
PRINT
PRINT " 1) All"
PRINT " 2) Record number"
PRINT " 3) Return"
INPUT " (1,2,3) ",select
IF select=3 THEN
GOTO 200
ENDIF
IF select=1 THEN
recnum1:=1
ELSE
INPUT "Record number: ",recnum1
IF recnum1<1 OR recnum1>filesize THEN
GOTO 220
ENDIF
ENDIF
221 GOSUB 500
222 GOSUB 520
PRINT
INPUT "(F,B,C,<ENTER>)",response
IF response<>"F" AND response<>"B" AND response<>"f"
AND response
<>"b" AND response<>"c" AND response<>"C" THEN
GOTO 200
ENDIF
IF response="c" OR response="C" THEN
GOTO 223
ENDIF
IF response="f" OR response="F" THEN
IF recnum1+1<=filesize THEN
recnum1:=recnum1+1
```

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```
GOTO 221
ENDIF
GOTO 200
ENDIF
IF recnum1-1>=1 THEN
recnum1:=recnum1-1
GOTO 221
ENDIF
GOTO 200
223 INPUT "Which field to correct? ",select
IF select<1 OR select>6 THEN
GOTO 222
ENDIF
ON select GOSUB 240,241,242,243,244,245
GOSUB 510
GOTO 222
240 INPUT "Name : ",adr1.name
RETURN
241 INPUT "Addr : ",adr1.address
RETURN
242 INPUT "City : ",adr1.city
RETURN
243 INPUT "State: ",adr1.stat
RETURN
244 INPUT "Zip  : ",adr1.zip
RETURN
245 INPUT "Phone: ",adr1.phone
RETURN

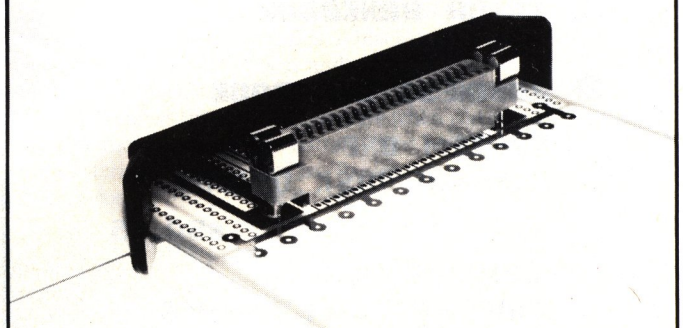
300 IF NOT(fopen) THEN
GOTO 1
ENDIF
PRINT CHR$(12);
PRINT " ** Sort **"
PRINT
PRINT " Sort by:"
PRINT "  1) Name"
PRINT "  2) Zip"
INPUT "  (1,2) ",select
IF select<1 OR select>2 THEN

GOTO 1
ENDIF
FOR xx=1 TO filesize-1
FOR yy=xx+1 TO filesize
recnum1:=xx
recnum2:=yy
GOSUB 500
GOSUB 501
IF select=1 THEN
IF adr1.name>adr2.name THEN
GOSUB 530
GOSUB 510
GOSUB 511
ENDIF
ENDIF
IF select=2 THEN
IF adr1.zip>adr2.zip THEN
GOSUB 530
GOSUB 510
GOSUB 511
ENDIF
ENDIF
NEXT yy
NEXT xx
GOTO 1

400 IF NOT(fopen) THEN
GOTO 1
ENDIF
PRINT CHR$(12);
PRINT " ** Print **"
PRINT
PRINT " 1) All"
PRINT " 2) Substring"
PRINT " 3) Return"
INPUT " (1,2,3) ",select
IF select=3 THEN
GOTO 1
ELSE
IF select<1 OR select>2 THEN
GOTO 400
ENDIF
ENDIF
all:=select=1
IF NOT(all) THEN
PRINT "Substring= Name or Zip"
INPUT "Substring? ",search
ENDIF

INPUT "Print phone number? ",response
prphone:=response="Y" OR response="y"
INPUT "Tab over? ",tb
INPUT "Spacing? ",sp
IF sp<1 THEN
sp:=1
ENDIF
OPEN #printpath,"/p":WRITE
FOR xx=1 TO filesize
recnum1:=xx
GOSUB 500
IF all THEN
GOTO 410
ENDIF
temp=SUBSTR(search,adr1.name)
IF temp=0 THEN
temp=SUBSTR(search,adr1.zip)
ENDIF
IF temp=0 THEN
GOTO 420
ENDIF
410 PRINT #printpath,TAB(tb); adr1.name
PRINT #printpath,TAB(tb); adr1.address
PRINT #printpath,TAB(tb); TRIM$(adr1.city); ",
"; TRIM$(adr1.stat
); "  "; adr1.zip
IF prphone THEN
PRINT #printpath,TAB(tb); adr1.phone
ENDIF
FOR yy=1 TO sp
PRINT #printpath," "
NEXT yy
420 NEXT xx
CLOSE #printpath
GOTO 400
500 SEEK #diskpath,(recnum1-1)*SIZE(adr1)
GET #diskpath,adr1
RETURN
```


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```
501 SEEK #diskpath,(recnum2-1)*SIZE(adr2)
GET #diskpath,adr2
RETURN
510 SEEK #diskpath,(recnum1-1)*SIZE(adr1)
PUT #diskpath,adr1
RETURN
511 SEEK #diskpath,(recnum2-1)*SIZE(adr2)
PUT #diskpath,adr2
RETURN
520 PRINT CHR$(12);
PRINT "Record #"; recnum1
PRINT
PRINT "1) Name : "; adr1.name
PRINT "2) Addr : "; adr1.address
PRINT "3) City : "; adr1.city
PRINT "4) State: "; adr1.stat
PRINT "5) Zip  : "; adr1.zip
PRINT "6) Phone: "; adr1.phone
RETURN
530 adr3:=adr1
adr1:=adr2
adr2:=adr3
RETURN
700 PRINT "Program terminated."
PRINT
END
800 errnum=ERR

IF errnum=2 THEN
GOTO 1
ENDIF

IF errnum=246 THEN
PRINT "Printer not ready!"
INPUT "Press ENTER when ready. ",response
GOTO 400
ENDIF

IF fopen THEN
CLOSE #diskpath
fopen:=FALSE
ENDIF

IF errnum=207 THEN
PRINT "Memory full."
GOTO 700
ENDIF

IF errnum=211 THEN
PRINT "End of file error."
GOTO 810
ENDIF

IF errnum=214 THEN
PRINT "No permission."
GOTO 810
ENDIF

IF errnum=215 OR errnum=216 THEN
PRINT "Bad path name."
GOTO 810
ENDIF

IF errnum=218 THEN
PRINT "File already exists."
GOTO 810
ENDIF

IF errnum=242 THEN
PRINT "Disk is write protected."
GOTO 810
ENDIF

IF errnum=248 THEN
PRINT "Disk full."
GOTO 810
ENDIF

PRINT "OS-9 Error #"; errnum
GOTO 700

810 FOR count=1 TO 10000
NEXT count
GOTO 1
(* END *)
```


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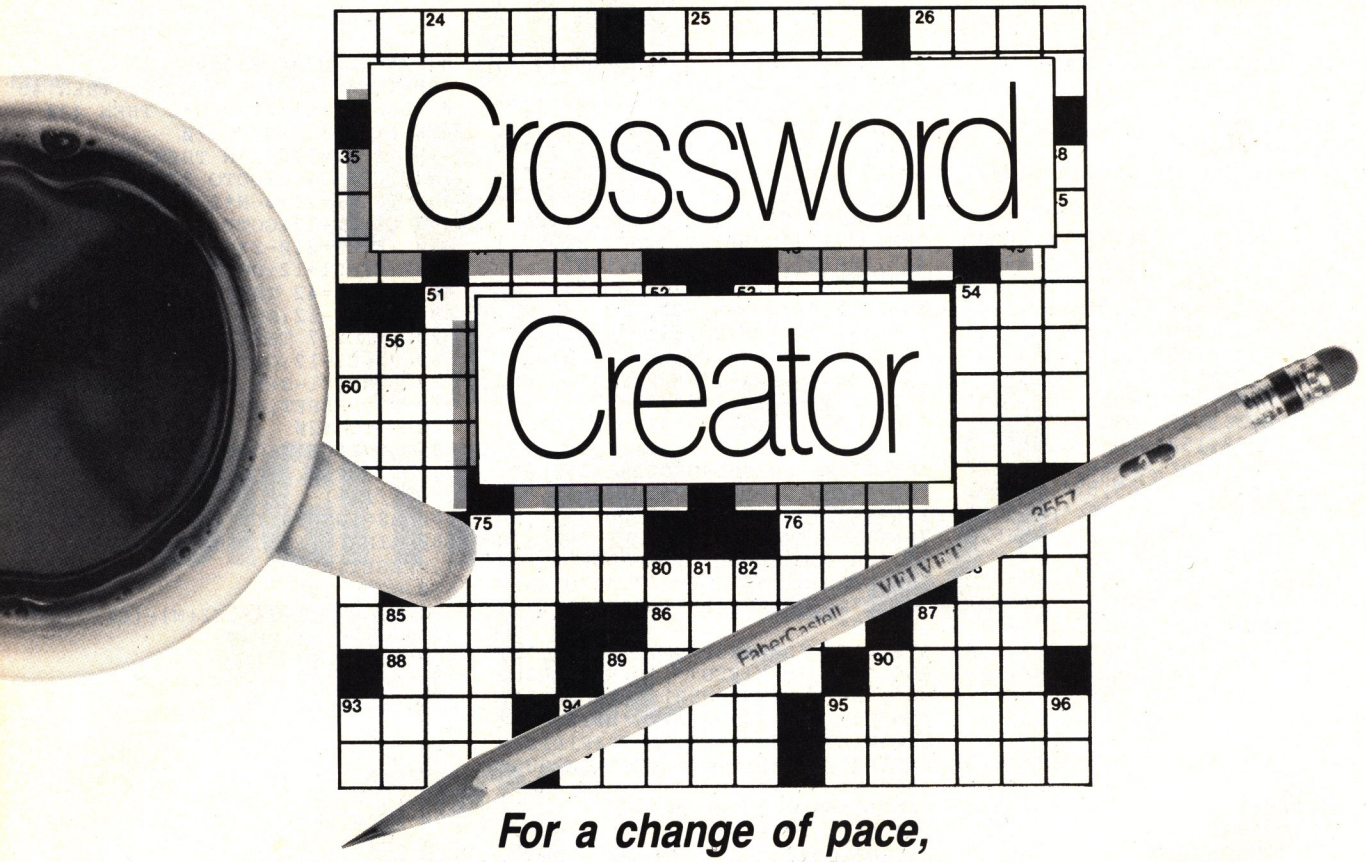
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by Jorge A. Murillo G.

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See the Instant CoCo ad elsewhere in this issue.



For a change of pace, make your own crossword puzzles.

It's no secret that people bitten by the crossword bug are as addicted to their daily puzzle as most Americans are to their morning cup of coffee. In many newspapers, the crossword probably ranks second only to the weather report as the most carefully scrutinized feature. While solving a difficult puzzle provides a sense of satisfaction, there's no better test of a wordsmith than creating a puzzle. Crossword Creator makes that process easier, reducing frustration and eliminating crumpled paper and worn-down erasers. It allows you to choose six grid sizes: 15 by 15, 13 by 13, 11 by 11, 9 by 9, 7 by 7, or 5 by 5. Even if you've never been a crossword enthusiast, you might enjoy working up puzzles for the kids. After all, crosswords aren't just for adults.

Using the Program

Type in and save the Listing on cassette; then run it. After the opening screen displays a grid-selection message, the screen clears. When you press the number corresponding to the grid of your choice, the program draws a blank puzzle.

1 15 by 15 Grid
2 13 by 13 Grid
3 11 by 11 Grid
4 9 by 9 Grid
6 5 by 5 Grid

The cursor—the small black stripe in the top left square—changes to white if it falls on a black square. Use the arrow keys to move from square to square. When you blacken a square or press a letter, the cursor moves horizontally to the next square. Press the one key to make the cursor move vertically; press the zero key to reinstitute horizontal movement. To blacken a square type an asterisk (*); to clear a blackened space, type a colon (:).

→	Moves the cursor to the right.
←	Moves the cursor to the left.
↑	Moves the cursor up.
↓	Moves the cursor down.
1	Makes cursor move vertically.
0	Restores horizontal cursor movement.
*	Blackens a square.
:	Clears a blackened or used square.
5	Blackens a square and its reciprocal.
8	Clears a square and its reciprocal.
$	Saves a puzzle.
'	Loads a saved puzzle.

Table 1. Summary of Commands

System Requirements

16K RAM
Extended Color Basic

Typing a letter or a black square in an occupied space substitutes new information for old. Use the five key to create symmetrical puzzles. It blackens the square and its reciprocal and advances the cursor to the next space. For example, if the cursor were on the top left square when you pressed the five key, the bottom right square would also be colored in. To clear a square and its reciprocal, use the eight key.

To save a puzzle, prepare your cassette recorder by setting the tape to the spot where you want to begin recording; then press the play and record buttons. When you type $, you hear clicks as the program saves each portion of the puzzle. The recorder stops and the screen displays an OK prompt when the save is complete. (The program saves all puzzles under the file name CRU; consequently it's a good idea to record the counter number, the subject matter, and the grid size for each crossword so that you can reload it easily later on.) To load a puzzle, run the program, selecting the same grid on which the crossword was saved. Position the tape at the beginning of the file and type an apostrophe ('). In a few seconds, the letters start appearing on the screen. (Refer to Table 1 for a summary of commands.)■

Address correspondence to Jorge A. Murillo G., Apartado 56, Escazu, Costa Rica.

Program Listing. Crossword Creator

```
10 CLS:PRINT@231,"CHOOSE SIZE GR
ID":FORX=1TO200:NEXTX
20 CLEAR200:DIM R$(225),R1$(26),
V(227)
30 PMODE 4,1
40 DATA "BM41,9","BM41,21","BM41
,33","BM41,45","BM41,57","BM41,6
9","BM41,81","BM41,93","BM41,105
","BM41,117","BM41,129","BM41,14
1","BM41,153","BM41,165","BM41,1
77","BM53,9","BM53,21","BM53,33"
,"BM53,45","BM53,57","BM53,69"
50 DATA "BM53,81","BM53,93","BM5
3,105","BM53,117","BM53,129","BM
53,141","BM53,153","BM53,165","B
M53,177","BM65,9","BM65,21","BM6
5,33","BM65,45","BM65,57","BM65,
69","BM65,81","BM65,93","BM65,10
5","BM65,117","BM65,129","BM65,1
41"
60 DATA "BM65,153","BM65,165","B
M65,177","BM77,9","BM77,21","BM7
7,33","BM77,45","BM77,57","BM77,
69","BM77,81","BM77,93","BM77,10
5","BM77,117","BM77,129","BM77,1
41","BM77,153","BM77,165","BM77,
177","BM89,9","BM89,21","BM89,33
","BM89,45","BM89,57"
70 DATA "BM89,69","BM89,81","BM8
9,93","BM89,105","BM89,117","BM8
9,129","BM89,141","BM89,153","BM
89,165","BM89,177","BM101,9","BM
101,21","BM101,33","BM101,45","B
M101,57","BM101,69","BM101,81","
BM101,93","BM101,105","BM101,117
"
80 DATA "BM101,129","BM101,141",
"BM101,153","BM101,165","BM101,1
77","BM113,9","BM113,21","BM113,
33","BM113,45","BM113,57","BM113
,69","BM113,81","BM113,93","BM11
3,105","BM113,117","BM113,129","
BM113,141","BM113,153","BM113,16
5","BM113,177","BM125,9"
90 DATA "BM125,21","BM125,33","B
M125,45","BM125,57","BM125,69","
BM125,81","BM125,93","BM125,105"
,"BM125,117","BM125,129","BM125,
141","BM125,153","BM125,165","BM
125,177","BM137,9","BM137,21","B
M137,33","BM137,45","BM137,57","
BM137,69","BM137,81"
100 DATA "BM137,93","BM137,105",
"BM137,117","BM137,129","BM137,1
41","BM137,153","BM137,165","BM1
37,177","BM149,9","BM149,21","BM
149,33","BM149,45","BM149,57","B
M149,69","BM149,81","BM149,93","
BM149,105","BM149,117","BM149,12
9"
110 DATA "BM149,141","BM149,153"
,"BM149,165","BM149,177","BM161,
9","BM161,21","BM161,33","BM161,
45","BM161,57","BM161,69","BM161
,81","BM161,93","BM161,105","BM1
61,117","BM161,129","BM161,141",
"BM161,153","BM161,165","BM161,1
77","BM173,9","BM173,21"
120 DATA "BM173,33","BM173,45","
BM173,57","BM173,69","BM173,81",
"BM173,93","BM173,105","BM173,11
7","BM173,129","BM173,141","BM17
3,153","BM173,165","BM173,177","
BM185,9","BM185,21","BM185,33","
BM185,45","BM185,57","BM185,69",
"BM185,81","BM185,93"
130 DATA "BM185,105","BM185,117"
,"BM185,129","BM185,141","BM185,
153","BM185,165","BM185,177","BM
197,9","BM197,21","BM197,33","BM
197,45","BM197,57","BM197,69","B
M197,81","BM197,93","BM197,105",
"BM197,117","BM197,129","BM197,1
41","BM197,153","BM197,165"
140 DATA "BM197,177","BM209,9","
BM209,21","BM209,33","BM209,45",
"BM209,57","BM209,69","BM209,81"
,"BM209,93","BM209,105","BM209,1
17","BM209,129","BM209,141","BM2
09,153","BM209,165","BM209,177"
150 FOR X=1 TO 225:READ R$(X):NE
XT X
160 DATA "BD1D6U4NR5U2E1R3F1D6",
"ND7R4F1D1G1NL4F1D2G1NL4BR1","BD
1D5F1R3E1U1BU3U1H1L3G1BD6BR5","D
7R4E1U5H1L4BD77BR5","NR5D3NR4D4R
5","NR5D3NR4D4BR5","BD1D5F1R3E1U
2NL2BU2U1H1L3G1BD6BR5","D7U4R5NU
3D4","R4L2D7L2R4BR1","BD5D1F1R3E
1U6BD7"
170 DATA "D7U4R3E2NU1G2F2D2","D7
R5","D7BU7F2R1E2D7","D1ND6E1R3F1
D6","BD1D5F1R3E1U5H1L3G1BD6BR5",
"ND7R4F1D2G1L4BD3BR5","BD1D5F1R3
E1U5H1L3G1D4BR3F2","ND7R4F1D1G1N
L4F1D3","BD1D1F1R3F1D2G1L3H1BU5E
1R3F1BD6","R4L2D7BR3","D6F1R3E1U
6BD7","D5F2E2U5BD7BR1"
180 DATA "D7E2NU1F2U7","D1F5D1BL
5U1E5U1BD7","D2F2ND3E2U2BD7BR1",
"R5D1G5D1R5"
190 FOR X= 1 TO 26:READ R1$(X):N
EXT X
200 PCLS(1)
210 SCREEN 1,1
220 A$=INKEY$:IF A$=""THEN 220
230 IF A$="1" THEN N=0:GOTO 300
240 IF A$="2"THEN N=12:GOTO 300
250 IF A$="3" THEN N=24:GOTO300
260 IF A$="4"THEN N=36:GOTO 300
270 IF A$="5" THEN N=48:GOTO300
280 IF A$="6" THEN N=60:GOTO300
290 GOTO 220
300 FOR X=38+N TO 218-N STEP 12
310 LINE(X,6+N) - (X,186-N),PRES
ET
320 NEXT X
330 FOR Y=6+N TO 186-N STEP 12
340 LINE(38+N,Y)-(218-N,Y),PRESE
T
350 NEXT Y
360 C1=42:C2=7
370 IF PPOINT(C1-2+N,C2+N)=0 THE
N 540 ELSE LINE (C1+N,C2+N)-(C1+
N+3,C2+N),PRESET,B:D2=(C1+N-42)/
12*15+(C2+N-7)/12+1
380 A$=INKEY$:IF A$="" THEN 380
ELSE 390
390 LINE(C1+N,C2+N)-(C1+N+3,C2+N
),PSET,BF
400 IF A$=CHR$(9) THEN 420 ELSE
IF A$=CHR$(10) THEN 450 ELSE IF
A$=CHR$(8) THEN 480 ELSE IF A$=C
HR$(94) THEN 500 ELSE IF A$=CHR$
(42) THEN 520 ELSE IF A$=CHR$(58
) THEN 580 ELSE IF A$="1" THEN 6
10 ELSE IF A$="0" THEN 620
410 IF A$=CHR$(56)THEN740ELSEIFA
$=CHR$(53)THEN690ELSEIFA$=CHR$(3
6)THEN790ELSEIFA$=CHR$(39)THEN84
0ELSEIF ASC(A$)-64<1 OR ASC(A$)-
64>26THEN370ELSE630
420 IF K=1ANDA$<>CHR$(9) THEN 45
0 ELSE IF C1=>210-N*2 THEN 440
430 C1=C1+12:GOTO370
440 IF C2=175-2*N THEN 370 ELSEC
1=42:C2=12+C2:GOTO 370
450 IF C2=>175-N*2 THEN 470
460 C2=C2+12:GOTO 370
470 IF C1=210-2*N THEN 370 ELSE
C2=7:C1=C1+12:GOTO 370
480 IF C1=42 THEN 370
490 C1=C1-12:GOTO 370
500 IF C2=7 THEN 370
510 C2=C2-12:GOTO 370
520 LINE(C1-3+N,C2+N)-(C1+7+N,C2
+10+N),PRESET,BF:V(D2)=227
530 GOTO 420
540 LINE(C1+N,C2+N)-(C1+N+3,C2+N
),PSET,BF:D2=(C1+N-42)/12*15+(C2
+N-7)/12+1
550 A$=INKEY$:IF A$=""THEN550
560 LINE(C1+N,C2+N)-(C1+N+3,C2+N
),PRESET,B
570 GOTO 400
580 LINE (C1-3+N,C2+N)-(C1+7+N,C
2+10+N),PSET,BF
590 V(D2)=0
600 GOTO 370
610 K=1:GOTO 370
620 K=0:GOTO 370
630 IF PPOINT(C1+N-1,C2+N+2)=0 O
R PPOINT(C1+N-1,C2+N+3)=0 THEN G
OSUB 670
640 DRAW"C0"+";"+R$(D2)+R1$(ASC(
A$)-64)
650 V(D2)=ASC(A$)
660 DRAW "C1":GOTO 420
670 LINE(C1-3+N,C2+N)-(C1+7+N,C2
+10+N),PSET,BF
680 RETURN
690 DRAW "C0"+";"+R$(D2)+"BU2BL2
D11R1U11R1D11R1U11R1D11R1U11R1D1
1R1U11R1D11R1U11R1D11"
700 V(D2)=227
710 DRAW "C0"+R$(226-D2)+"BU2BL2
D11R1U11R1D11R1U11R1D11R1U11R1D1
1R1U11R1D11R1U11R1D11"
720 V(226-D2)=227
730 DRAW "C1":GOTO 420
740 DRAW "C1"+";"+R$(D2)+"BU2BL2
D10R1U10R1D10R1U10R1D10R1U10R1D1
0R1U10R1D10R1U10R1D10"
750 V(D2)=0
760 DRAW "C1"+R$(226-D2)+"BU2BL2
D10R1U10R1D10R1U10R1D10R1U10R1D1
0R1U10R1D10R1U10R1D10"
770 V(226-D2)=0
780 GOTO 370
790 OPEN "O",#-1,"CRU"
800 FOR X=1 TO 225
810 PRINT #-1,V(X)
820 NEXTX
830 CLOSE#-1:END
840 OPEN"I",#-1,"CRU"
850 FOR X=1 TO 225
860 INPUT #-1,V(X)
870 IF X=226 THEN 940
880 IFV(X)=227THEN900
890 IFV(X)=>1THEN920ELSE930
900 DRAW "C0"+";"+R$(X)+"BU2BL2D
11R1U11R1D11R1U11R1D11R1U11R1D11
R1U11R1D11R1U11R1D11"
910 GOTO 930
920 DRAW"C0"+R$(X)+R1$(V(X)-64)
930 NEXT X
940 CLOSE#-1:DRAW"C1":GOTO360
```

END

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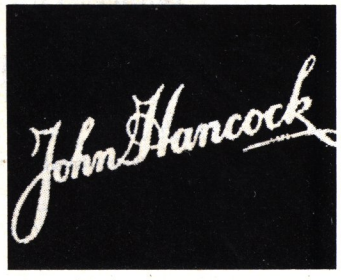
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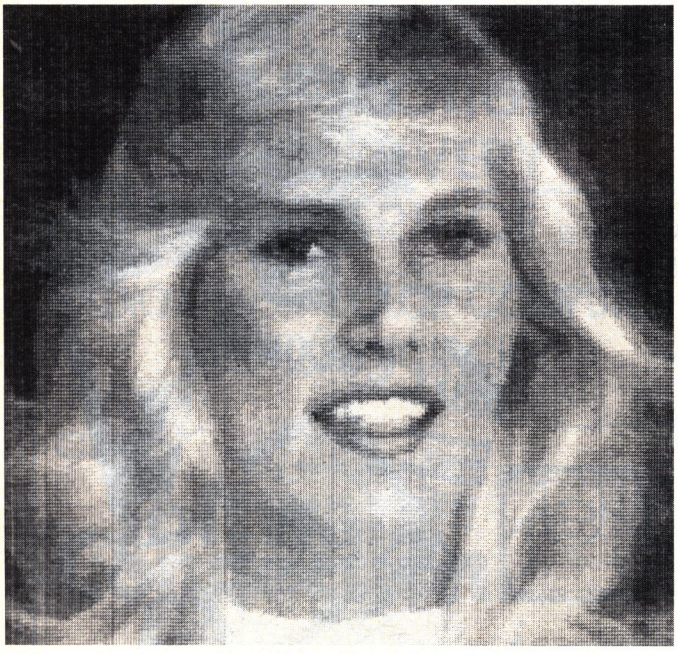
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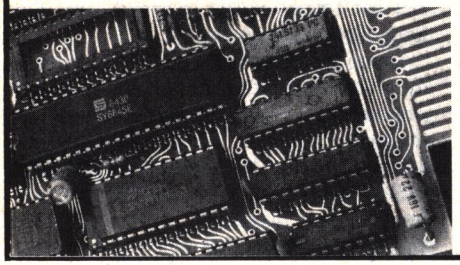
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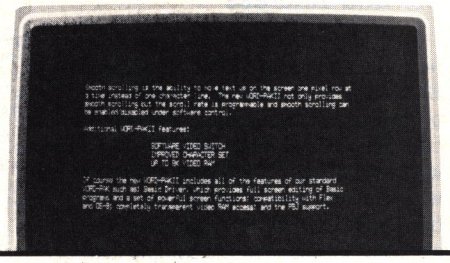
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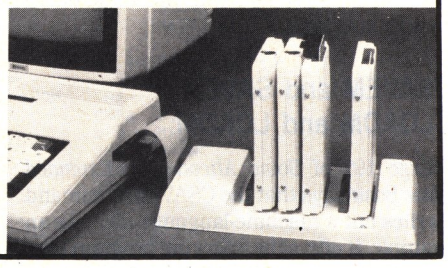
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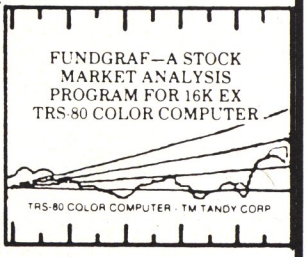
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Assembly 101

by James and Victor Perotti

Getting the Right Address

To follow this column, you will need an editor/assembler. The authors use The Micro Works' Macro-80C disk assembler, and changes are given for Radio Shack's EDTASM+. Other editor/assemblers will work, but the programs may require some additional modification. The documentation that comes with your software should provide the commands you need.

There are many little secrets that you won't necessarily find in computer manuals. This month, we'll look at some of the esoteric facts hidden in the world of Assembly language.

CSAVEM and SAVEM CLOADM and LOADM

Page 192 of *Going Ahead with Extended Color Basic* says that the CSAVEM command "writes out a machine-language file." As an example, it offers the following program line: CSAVEM "X", &H4E, &H6F, &H5F.

Does that make sense? The assembler software usually takes care of saving files. The A file name (assemble file) instruction of EDTASM+ assembles binary files onto a cassette file. You'll rarely have to CSAVEM a file, but when you do, you'll have to understand the command's syntax. The syntax for both CSAVEM and SAVEM is as follows:

CSAVEM "file name", start address, end address, EXEC (or transfer) address <CR>

SAVEM "file name/ext:drive", start address, end address, EXEC (or transfer) address <CR>

The syntax is easy enough, but where do you get the three addresses, and what's an EXEC address?

When the computer loads a tape or disk file into RAM, it needs the RAM location at which it is to write. It also needs the address at which the EXEC command begins to execute the program. Therefore, when files are written or saved to tape or disk, those locations are also saved. Each tape file begins with a header containing the file name; type of file; and, for machine-language files, the start address, EXEC address, and end address. Each binary disk file contains the length of the file, start address, and EXEC address; the end address is computed.

The start address should be easy. If the program begins with an ORG addr statement, the addr is the address to use. Macro-80C uses $0E00 as the default start address. If a disk file with no ORG is saved, use $0E00. EDTASM+ programs should include an ORG statement and should be assembled with A/AO (absolute origin). ORG $0600 is nice for cassette, ORG $0E00 works well for disk, and ORG $5800 is good with ZBug.

You can find the end address at the bottom of the list of addresses on the left side of each Assembly listing. Again, the three columns on the left contain the line numbers, the addresses for that line of code, and the object code for the instructions. The last number in the column second from the left is the end address.

When the Start Address Is Not the End Address

Some programmers begin programs with nonexecutable code. The Program Listing, ERRMSG, is an example: It begins with lines of messages and equates that will not execute. Hence, you can't use the start address with EXEC, you'll have to use the command with the address at which program execution begins. The BEGIN label marks the start of executable code in the sample listing.

EDTASM+ users must delete the START label in line 3. Then delete the hexadecimal values at the end of the operand field in lines 7–12. As you delete each hex value, insert a new line following the deletion. The new line should have the statement FCB followed by the hex value from the preceding line's operand field. For example, change line 7 to:

```
MSG1  FCC  /SYNTAX  ERROR/
```

Insert the new line that reads FCB $03.

You can find the EXEC address for this program in two ways. The address in the symbol table for the label BEGIN is given as $E057. Line number 13, where the program should execute, is followed by the address at which the object code is stored: again, $0E57. Therefore, the EXEC address is $0E57.

Both EDTASM+ and Macro-80C would save this program with a start address of $0E00, an end address of $0EA2, and an EXEC address of $0E00. LOADM:EXEC would get you nothing but grief. You need to fix the EXEC address. Load the binary file into memory ($0E00 to $0EA2), then SAVEM or CSAVEM the file with:

```
SAVEM "ERRMSG/BIN", &H0E00
&H0EA2, &H0E57
```

Now, when you CLOADM or LOADM ERRMSG, the EXEC command will automatically EXEC &H0E57. (EDTASM+ ROMpack users must adjust the CSAVEM addresses since your ORG statement will be $0600 instead of $0E00.) More technically, the EXEC address will be used to update the program-counter register to $0E57, which designates where execution is to begin. The problem with this file also becomes apparent when you use ZBug or DCBug. You must change ZBug's PC register or DCBug's P register to $0E57 before you hit the GO command. Binary programs GO, or execute, wherever the PC points.

Debugging with the Bugs

No one writes a complex computer program that runs the first time out. *No one.* Everyone must debug their programs. Debugging (diagnostic) skills are at least as important as the original writing. As beginning Assembly-language programmers, you can't let yourselves get frustrated with programs that don't run—expect to spend some time diagnosing the problem.

As you know by now, Assembly programs are much more difficult to debug than Basic programs are. The problem is that Assembly programs often don't tell you what's wrong. However, DCBug (Macro-80C) and ZBug (EDTASM+) are designed to provide you with the necessary diagnostic information. Both show the contents of the registers at strategic points, and then you can check the registers in your program for the appropriate range of numbers.

The ERRMSG program uses the X register to hold the screen address at which the text will print; if a register dump yields an X address below $0400 or above $5FF, check the program to find out what's wrong. If the Y register, which holds the address of the error message and prompt texts, is either below $0E00 or above $0E56, then instructions affecting Y are wrong. If the program-counter (PC or P) register goes above the end address of $0EA2, a branch or jump has taken you to Lala land.

The R command in most Bugs dumps the registers. When the program hits a breakpoint, an SWI that is $3F, the registers are automatically dumped. Therefore, it is a good idea use an SWI ($3F) rather than JMP BASIC to end programs you are debugging. If the program makes it to the end, it will jump into the bug program with a register dump, whereas exiting to Basic offers no diagnostic information.

It is easy to set breakpoints at critical points in the program, thereby testing how things are going at the time. Stick one in after line 15, JSR SHOW, to check the X and Y registers. Put another one after line 20, BEQ DONE, to see how X,Y, and A look at that point.

You can use DCBug's B command to insert breakpoints. Type B and the address at which you want to insert the breakpoint. When the breakpoint ($3F) is encountered, the program dumps the registers, erases the

breakpoint, and replaces the original contents. Hitting GO again starts program execution at that byte.

ZBug has many more features than DCBug. The X address command inserts a breakpoint ($3F) at the address. the GSTART instruction begins execution at the label START, a register dump occurs at the breakpoint, and the C instruction continues execution. ZBug lets you step through the program one instruction at a time, inspecting the registers and memory after each instruction. Placing a comma after an address starts the one-step-at-a-time process. The next instruction is executed with another comma, as in this example:

```
0E00, (starts execution in memory)
R     (dumps the registers)
,     (executes the next instruction)
```

And please, *save* your programs. ■

Write to Victor and James Perotti at 163-D Pine Grove Heights, Athens, OH 45701.

Program Listing. ERRMSG

```
0001 0E00                START   ORG    $0E00

                         **  SOME LABELS

0002 A928                CLS     EQU $A928
0003 A1B1                POLCAT  EQU $A1B1
0004 A30A                PRINT   EQU $A30A
0005 0088                CURSOR  EQU $088
0006 0440                VIDRAM  EQU $440


                         **  3 ERROR MESSAGES:

0007 0E00 53594E5441     MSG1    FCC  /SYNTAX ERROR/,03
0008 0E0D 464154414C     MSG2    FCC  /FATAL ERROR/,03
0009 0E19 574F524C44     MSG3    FCC  /WORLD IS ENDING/,03

                         **  SCREEN PROMPT HERE:

0010 0E29 5748494348     PROMPT FCC /WHICH ERROR /,$0D
0011 0E36 4449442059             FCC /DID YOU MAKE? /,$0D
0012 0E45 4849542042             FCC /HIT BREAK TO EXIT/,3

                         **  PROGRAM BEGINS HERE:

0013 0E57 BDA928         BEGIN   JSR   CLS
0014 0E5A 318CCC                 LEAY  PROMPT,PCR
0015 0E5D BD0E92                 JSR   SHOW

0016 0E60 860D           MAIN    LDA   #$0D
0017 0E62 BDA30A                 JSR   PRINT
0018 0E65 BDA1B1                 JSR   POLCAT
0019 0E68 8103                   CMPA  #03        BRK KEY EXITS
0020 0E6A 2732                   BEQ   DONE
0021 0E6C 8131                   CMPA  #'1
0022 0E6E 270A                   BEQ   ONE
0023 0E70 8132                   CMPA  #'2
0024 0E72 270E                   BEQ   TWO
0025 0E74 8133                   CMPA  #'3
0026 0E76 2712                   BEQ   THREE
0027 0E78 20E6                   BRA   MAIN

0028 0E7A 318C83         ONE     LEAY  MSG1,PCR
0029 0E7D BD0E92                 JSR   SHOW
0030 0E80 20DE                   BRA   MAIN

0031 0E82 318C88         TWO     LEAY  MSG2,PCR
0032 0E85 BD0E92                 JSR   SHOW
0033 0E88 20D6                   BRA   MAIN

0034 0E8A 318C8C         THREE   LEAY  MSG3,PCR
0035 0E8D BD0E92                 JSR   SHOW
0036 0E90 20CE                   BRA   MAIN

                         ***  SHOW ROUTINE

0037 0E92 A6A0           SHOW    LDA   ,Y+
0038 0E94 8103                   CMPA  #03
0039 0E96 27C8                   BEQ   MAIN
0040 0E98 BDA30A                 JSR   PRINT
0041 0E9B 20F5                   BRA   SHOW
0042 0E9D 39                     RTS

0043 0E9E 0A71           DONE    DEC   $71
0044 0EA0 BDA027                 JSR $A027
0045 0EA3                        END
```


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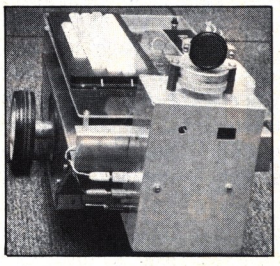
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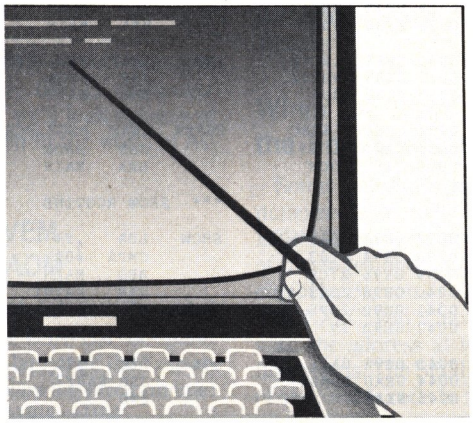
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My Gift to Teachers

by Nancy Kipperman



Have you ever approached the holiday season wishing you had the ability and money to make dreams come true? I've always thought it would be heavenly, just once, not to have limits in choosing gifts for other people. Of course, I don't know this column's readers well enough to pick out personal gifts. However, I'd like to describe a general present that I'd give to teachers if I had the power and resources. Please go along with me as I spell out my fantasy.

To do this, I have to make some basic assumptions. First, I'll assume that all you educators reading this magazine are interested in using the Color Computer in your classrooms. I'll also assume that you are so dedicated to your profession that you won't mind spending part of your Christmas vacation in pursuit of professional excellence.

Here's Your Ticket

Are you ready for the gift? I'd like to send each of you a round-trip airplane ticket from the nearest airport to Hawaii for a four-day stay. I choose Hawaii because I've never been there and would like to go. (If you spend the winter in New Hampshire, you begin to dream of warm sand and hot sun.)

When you reach Hawaii, you'll be put up at a luxurious hotel; all hotel employees will treat you with the utmost respect and courtesy. (Remember, this is a fantasy!) There will be time for everything. Meals will be fabulous, and no one will have to eat lunch in 20 minutes or while correcting quizzes.

All the guests in this hotel will be other teachers who, like you, are looking for the best ways to integrate the Color Computer, classroom curriculum, and teaching style. I envision teachers with similar interests naturally drifting into groups. You can pick the scenery—by the pool, in the lounge, or on the beach.

In the busy teaching profession, there is little time to exchange ideas and practices—on more than a superficial level—with educators outside the sphere of daily contact. These four days would provide the opportunity for you to share information—what's available, what works well, and what might be possible.

Furthermore, in my experience, educational magazines present few programs or packages for the CoCo. I *know* there are programs not mentioned in these publications; certainly there are teachers using programs they have written for the Color Computer. Some of this software finds its way into the public domain, but much of it is used by too few. Teachers know what works in the classroom. What better source of authors and effective programs could there be?

Share and Profit

Naturally, displays of commercially available educational software for the Color Computer will be set up in a large conference room. This time, however, teachers and students who have used the product will man the booth along with company representatives. There will be a room where videotape programs show actual classroom computer use; at the networking demonstration, you can be the students while a teacher shows new software or presents a real lesson.

In another session, all participants will wear blindfolds so that teachers can ask questions—even "stupid" ones—without fear of recognition. An expert will answer these questions patiently and in terms that all can understand. After all, you don't have to be able to build a computer to use one!

A room should be set aside for programs that make the routine of teaching easier: grading programs, record-keeping programs, and (please, Santa) composition-correcting programs. How many teachers are still writing in grades on computerized report cards? There has to be an easier way!

In yet another room, decision makers from Tandy will listen to teachers' ideas. Perhaps the center of the room could contain a giant suggestion box or a computer where teachers can type in suggestions. Best of all, Tandy would inform attendees what is planned for the CoCo.

End Results

After four days of wining, dining, sunning, and sharing, you would have to use the second part of the airline ticket and return to your normal lives. What would you bring back besides tans, souvenirs, and memories? I envision several on-going benefits.

First, I hope you would return with new professional friends, drawn from a variety of geographical locations, who share an interest in computers and education. The exhilaration that results when teachers have time to exchange ideas, methods, successes (and failures), philosophies, and conclusions would generate new enthusiasm that would carry over into the classroom.

Second, by the end of the conference, a structure would evolve to ensure future exchanges of ideas. The form isn't clear to me; it might be a periodic newsletter, a monthly magazine, or a bulletin-board service. Finally, the meeting would give Tandy and software manufacturers a clearer idea of what teachers want and need for the classroom.

Of course, I know this gift is one I can never bestow. And, if we meet in Hawaii, it will most likely be after I've retired and won a lottery somewhere. In reality, our only media for exchange are this column in *HOT CoCo*, the U.S. mail, and our contact with other CoCo-minded educators. So, let's make the most of it for the time being. Aloha! ■

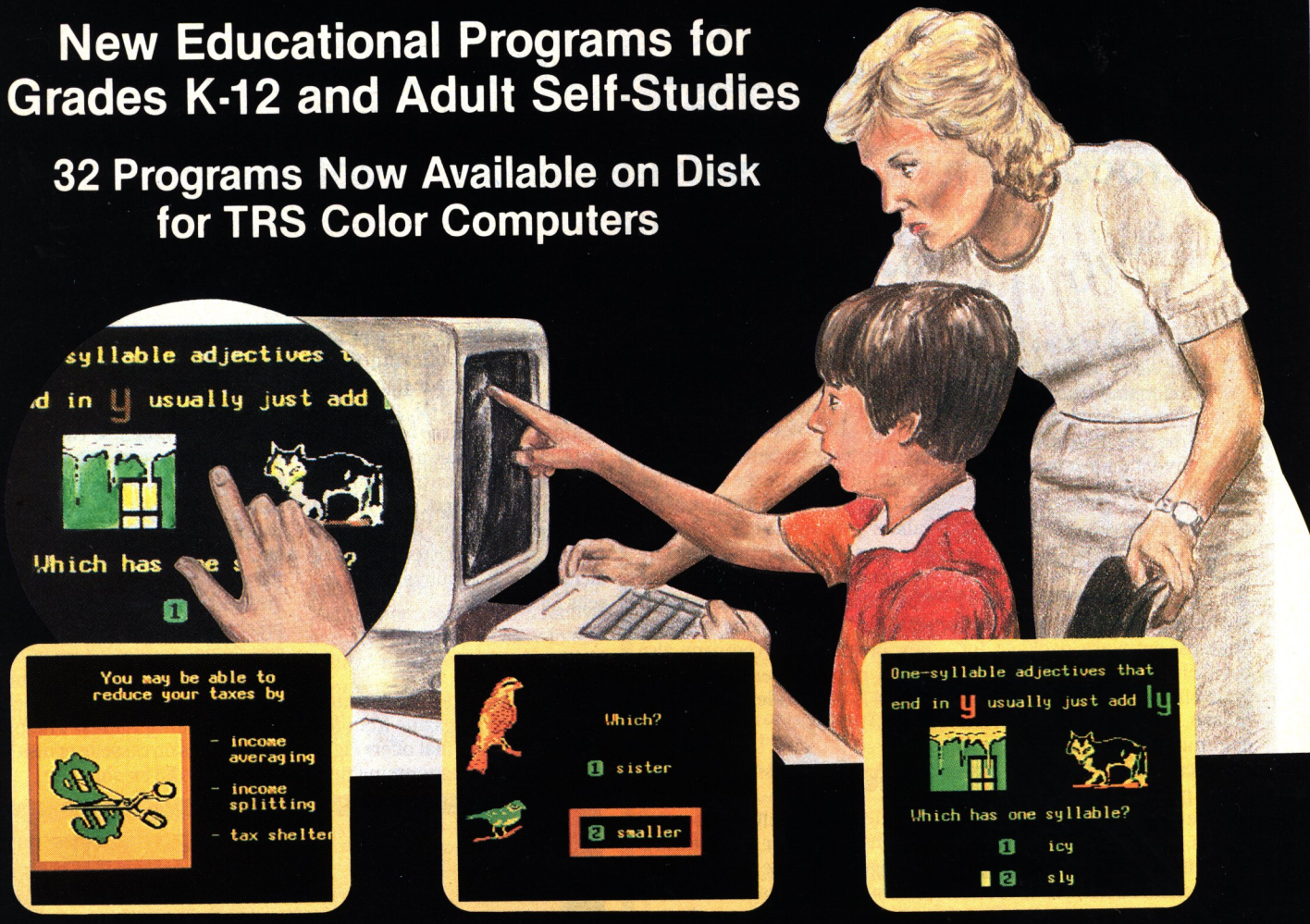
Nancy Kipperman is HOT CoCo*'s Education Editor and an English teacher at Conant High School in Jaffrey, NH. Write her c/o* HOT CoCo, *80 Pine St., Peterborough, NH 03458.*

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Product News

by J. Scot Finnie

PenPal, JTJ's CoCo Base I, New Developments at Infocom, MichTron's Rommel 3-D, *CoCo TIME* from Microcom, the Universal Mac Inker, Syntrax, and More

Information related in the Product News section is supplied by manufacturers. HOT CoCo has not tested or reviewed the products discussed here and cannot guarantee manufacturers' claims.

PenPal phone home. Four Star Software's **PenPal** might be the first truly integrated business-software package for the Color Computer. The program offers a word processor, database manager, spreadsheet, communications package, and graphics option. The latter provides pie charts, bar graphs, stacked bar graphs, linear graphs, dotted graphs, horizontal positioning, and other graphics selections. It also prints in two sizes. What's more impressive, however, is that the program can display 128 textures with colors that give its charts a professional look and make them easy to read.

PenPal uses function-key selections based on clear/number-key combinations that are similar to those used by MS-DOS applications. A command area at the bottom of the screen displays available commands. There is also on-line help. PenPal requires 64K and a disk drive. Four Star is offering it at the introductory price of $69.95 ($89.95 in Canada) through January.

JTJ Enterprises, makers of CoCo Solver and Program Generator, has released an interactive database manager. With **CoCo Base I**, the user specifies the structure of the database and then adds and edits records with that structure. The program has the capability to create sorted index files of any field that can, for example, be used to create sorted printer listings. The package also includes a program called Action that allows you to write commands for each record of your database in Basic. The new commands can be executed sequentially or with the index file. JTJ has plans for a full line of database programs that will complement CoCo Base I. The program requires 32K, Extended Color Basic, and a disk drive. It sells for $49.95. Along with the new program, the company also has a new address: P.O. Box 118041, Nashville, TN 37211, 615-331-0364.

Gameland

Believe it when you see it? After nearly a year of frustration for eager would-be adventurers, Infocom has announced that it intends to do its own marketing of the well-known **Infocom Interactive-Fiction Series** to the Color Computer community. Tandy was reportedly considering making the text-adventure games available in Radio Shack stores but appears to have decided against marketing them. The series, which includes **Suspect**, **Infidel**, and **Suspended**, was ported to the CoCo about a year ago.

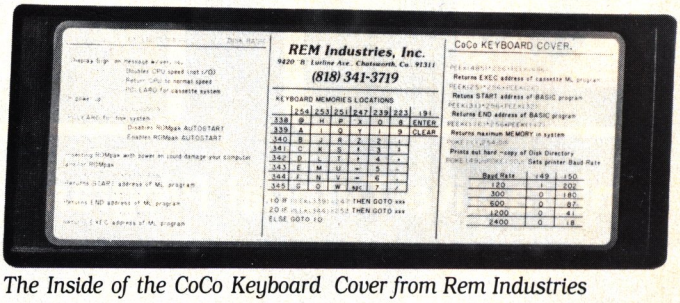
At this writing (in late August), Infocom expects to release its entire line of adventure programs and is targeting a release sometime during the holiday buying season. However, the only title the company will confirm as an imminent release is its best-selling **Hitchhiker's Guide to the Galaxy**. Prices for the popular text adventures will range from $34.95 to $44.95. They will be available directly from Infocom. Call the company's 800 number for more information.

MichTron has added a new machine-language offering to its highly touted arcade-game lineup. **Rommel 3-D** pits you against the infamous "Desert Rat." This is tank-to-tank warfare with tank controls, sights, and radar against everything Rommel can throw at you. The program was written by Kary McFadden. It requires 32K and sells for $29.95.

Utilitarianism

CoCo TIME is a new cassette- or disk-based magazine from Microcom Software that offers eight to 10 utilities, programming tips, business and home-management applications, tutorials, and educational programs every month. Subscribers will also receive free advice and help on their Basic and machine-language programs, free classified ads in *CoCo TIME*, and 10 percent off on all Microcom software and books. The annual subscription rates are $65 on cassette and $75 on disk. The single-copy rates are $10 and $15, respectively. Microcom has also announced the second volume of its ***Utility Routines for the Tandy & TRS-80 Color Computer***, which will sell for $19.95.

The Font Shop is a utility from Atmospheres that allows 64K Color Computer owners to edit and compile a Basic program that will load an alternate character set in Okidata Microline 84, 92, or 93 printers. The new character set can then be called with simple printer codes through Basic programs or imbedded commands made with a word processor. To create a character set, you use the arrow keys to move around a high-resolution grid and press the enter key to set pixels. Newly created character sets do not affect existing printer features. The Font Shop comes with three ready-to-use character sets, including Italics. The program comes on cassette or disk for $29.95 plus $3 for shipping.



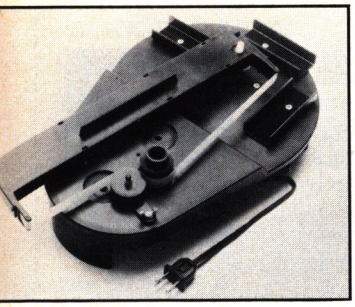
The Inside of the CoCo Keyboard Cover from Rem Industries

Gadgets

Rem Industries has a new product that is just the thing for helping to prevent the Coca-Cola blues. The company's new **CoCo Keyboard Cover** (catalog no. AM604), fits on any Color Computer keyboard (including most third-party keyboard products) and sports a five-color CoCo information decal on its inside cover. The decal lists helpful hints, including keyboard memory locations and baud rates. The CoCo Keyboard Cover sells for $9.95 plus $2.50 for shipping within the continental United States.

Computer Friends has a complete line of products for reinking

your printer ribbon. The company also offers a means of inking blank printer cartridges with red, green, blue, brown, yellow, or purple ink. Their latest product is the **Universal Mac Inker**, which comes in either cartridge or spool models. It can automatically reink the fabric ribbons of almost any printer on the market. Computer Friends claims that a good quality ribbon can be reinked as many as 100 times. Because the cost of reinking a ribbon is only about 5 cents, it might be a good idea to investigate this product if you have printer-intensive applications. The Universal Mac Inker sells for $60 and each cartridge-driver kit is $8.50.



Computer Friends' Universal Mac Inker

Making Beautiful Music

Intercomp Sound is a new company that produces MIDI (for musical instrument digital interface) hardware and software for the Color Computer. The company offers two products, **Color Midi Connection** and **Syntrax**, which work together to let your CoCo produce advanced synthesized sound. Color Midi Connection is the hardware interface that connects the CoCo to any MIDI-compatible synthesizer or device. It sells for $98. Syntrax is a 16-track sequencer software package that drives the Color Midi Connection. It is interactive and also contains an easy-to-use editor for creating and modifying sequences. Syntrax requires 64K, a disk drive, and Color Midi Connection. It sells for $105. ■

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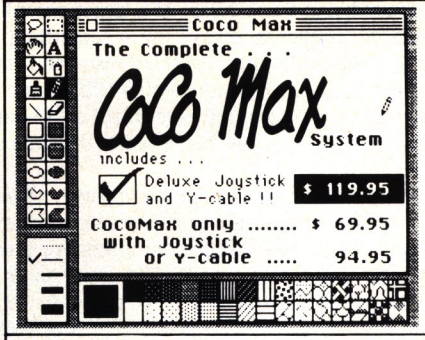
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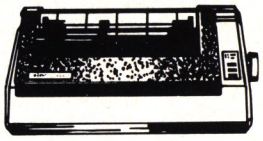
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The Corner Office

by Jeff DeTray, Publisher

Home Computers— A Time of Change

One of the side benefits of being a subsidiary of a larger parent company is that one far-flung division or another is always up to something interesting. This time, it's LINK Resources, a small but highly respected research firm located on Park Avenue in New York. Early this year, LINK conducted its 1985 Home Media Consumer Survey, the results of which have just been released. LINK's 148-page report of their findings make fascinating reading for anyone interested in the state of the home computer market.

Those of us who use computers every day for work and play tend to forget that we're still pioneers. We are what the researchers call "early adopters"—the first on the block to embrace new technologies. Even now, home computers are just getting started, with only one U.S. household in ten owning one. But those same households also account for a disproportionate share of the VCRs, video games, compact disk players, component television, and other high-tech gadgets. We're the best thing that ever happened to the consumer electronics industry!

So which computers are used most at home? Here is how homeowners responded to that question:

Commodore	35%
Apple	14
Texas Instruments	11
Tandy/Radio Shack	10
Atari	10
IBM	7
Coleco	1
Other	12

Of the companies mentioned, TI and Coleco have withdrawn from the market, so they won't be a factor in years to come. Commodore, Apple, and IBM have all gained ground in the home market during the past year. Atari has remained about the same, while Tandy has slipped three points from 13 percent to 10 percent of the home computer market. The increasing success of Apple and IBM in the home market lends credence to the theory that many families are now willing to spend more to get more in a home computer. In fact, consumers (that's you and me, folks) now spend an average of $808 on hardware when they make a home computer purchase. We've come a long way since the days of the $49.95 Sinclair ZX-80s.

What about the 90 percent of American households without home computers? What are the trends? The LINK Research study found that 57 percent of the non-owners were likely or very likely to purchase a home computer by the end of 1985. Compared to a year earlier, the non-owners were less likely to buy a computer for game playing and more likely to see home computers in a more "serious" light (don't they know some of use get *very* serious about games?). An astounding 41 percent of the non-owners planned to spend more than $1,000 on their first home computer.

And what will they buy? The brands of home computers most likely to be purchased are as follows:

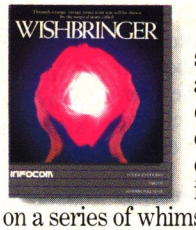
Apple	29.8%
IBM	19.1
Commodore	10.8
Tandy/Radio Shack	2.8
Atari	1.0
Other/Don't Know	36.5

Clearly, the definition of "home computer" is no longer a "low-cost computer." A home computer is now any computer bought for home use with household funds, and the trend is toward more expensive models. It seems to me that the home market isn't dying, it's merely changing, and changing for the better. ■

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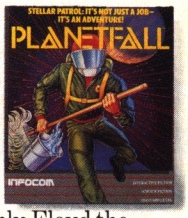
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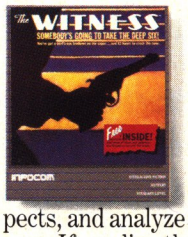


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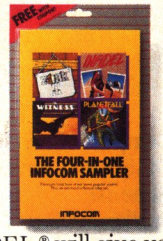


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>DRINK THE BEER

And the story responds:

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Suppose, on the other hand, you decide to:

>EXIT THE VILLAGE PUB THEN GO NORTH

In that case you'll be off on the most mind-bogglingly hilarious adventure any earthling ever had.

You communicate – and the story responds – in full sentences. So at every turn, you have literally thousands of alternatives. If you decide it might be wise, for instance, to wrap a towel around your head, just say so:

>WRAP THE TOWEL AROUND MY HEAD

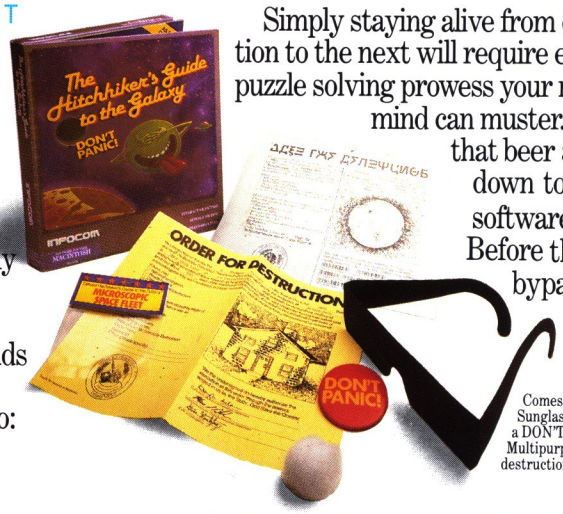
And the story responds:

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The ergonomically-superior HJL-57 has sculptured, low profile keycaps; and the three-color layout is identical to the original CoCo keyboard.

Compare Construction.

The HJL-57 has a rigidized aluminum baseplate for solid, no-flex mounting. Switch contacts are rated for 100 million cycles minimum, and covered by a spill-proof membrane.

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